

# NATURE MAGAZINE



May, 1949

50 Cents

Vol. 42, No. 5

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## Letter to the Editor

Editor, *Nature Magazine*:

I like your magazine. That is why I have continued to read it since I don't know when. I am going to put on paper things I have been itching to say for years. I am a hunter, with rifle, with field glass and with camera. As a boy I had the use of my grandfather's muzzle-loading musket as soon as I could hold it to aim, BUT—I was taught, and in sentences often punctuated with the springy end of a white oak ramrod, to obey the law, never to shoot harmless creatures and never to kill more than we could handily eat. If every boy could have similar training the game conservation question would be solved in one generation. A young war veteran of my community has that same idea, and is promoting a rifle club, strictly for boys. It is a nonprofit enterprise, and I think he has the only solution to game conservation, and to the safe use of the woods by hunters. The love of guns, and of hunting and camping, is inherent in practically all boys. It should have an outlet.

Every so often a "holy war" is proclaimed against some species of bird or beast on pretext that the game shortage will thus be overcome. Actually these campaigns are of profit only to makers of ammunition, aside from furnishing enjoyment to those whose gun practice must include the letting of blood. Target shooting for the rifleman, and clay pigeons for the shotgun enthusiast, will keep hand and eye trained, and furnish amusement for lovers of guns. It helps keep young fellows out of mischief too.

There is no patent on this idea for training boys. Anybody can start a similar club.

Every far-sighted man knows that the end of our game is in sight unless something is done, and soon. Poaching, year-around hunting, the careless shooting of anything that wiggles the brush, and, as I have seen, the deliberate shooting of a doe "just to see if I could hit a buck, in case I should see one," then leaving the doe lie. Of course lax law enforcement is partly to blame for these conditions. Every deep woods hunter knows these things, every ranger knows them. Every law enforcement officer knows them.

Well, we cannot regenerate the adult wolverines and weasels with two legs, but we can try to train the cubs.

I would like to see a column in *Nature Magazine* called "Nature Through a Field-glass;" dealing with the subjects the name suggests. Many a beast owes an extended lease of life to the fact that, when I spotted it, it was doing something that I had more interest in seeing than I had in dragging home a bloody carcass, for which I had no need. As when I enjoyed a ringside seat watching a bear and her two cubs robbing a bee tree one day. I went to camp empty handed, but with ribs sore from laughing and with a most

enjoyable memory. Mama and her cubs are, I hope, still roaming the woods.  
Fred L. Blaisdell.

## SMOKE-EATERS

By W. L. McATEE

Fires in grassland, as I have seen them, have not been the limitless, raging, all-destroying conflagrations described by early writers on prairie scenes. Rather they have remained of about the same size and force and have travelled almost leisurely, and apparently selectively, in irregular courses as if all of the area was not suitable for them—possibly due to the distribution of ground moisture. They have distinctly been restricted units that could be observed leisurely at a distance and even approached closely from most directions without risk of being engulfed. Watching their billowing smoke (not much blaze is seen), one notes floating and darting figures about them. They can be only birds and on nearer view, one sees that they include hawks, of which the marsh and sparrow hawks are often observed.

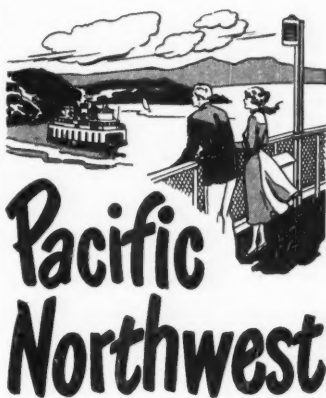
Once on a highway that led through the smoke of one of these ground fires we proceeded slowly, then stopped when we saw that we were in the midst of a group of Swainson's hawks. They were low in planted trees on each side of the road and would have been easy marks for a collector or killer. Being in the "thick of things," we saw that smaller birds, especially butcherbirds and mockingbirds, also were attracted to the fire. The lure for all is prey bereft of its cover—insects, mice, any small creatures, appealing to the taste of the devourers, which the fire has rendered temporarily homeless. The scene is a busy one; such leaping and scampering, such swooping and grabbing must seldom be seen but at such a fire-produced, free-for-all feast.

At the great prairie fires, vultures were said to be usual guests, soaring effortlessly overhead, apparently serene in the knowledge that their carrion table would soon be set. I was interested to read also in Thomas Pennant's old book, the "Arctic Zoology" (1785) that night-birds too come to fires. Doubtless quoting the notes of some now unknown employee of the Hudson's Bay Company, he wrote that the hawk owl "like the short-eared owl will hover over the nocturnal fires" (p. 235).

In Latin America these fire visitors are sometimes called *bebehumos*, that is, smoke-drinkers, but in the tongue of Florida observers, they were dubbed "smoke-eaters."

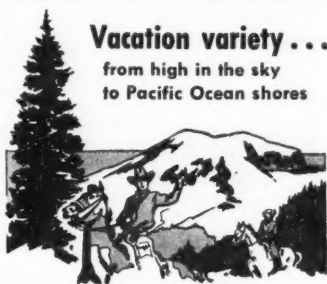
## Migration

"Mysteries of Bird Migration" is the subject of the *Audubon Nature Bulletin* for March, 1949. The article that makes up this four-page pamphlet is written by George Dock, Jr., and is illustrated with maps showing general migratory routes.



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THE MILWAUKEE ROAD

# Nature in Print

By HOWARD ZAHNISER

TO TEACH the love of the land and an appreciation of rural living, two College of Saint Teresa teachers at Winona, Minnesota—Sister M. Pascal Campion, O.S.F., and Sister M. Bede Donelan, O.S.F.—have recently edited, annotated, and compiled a delightful and stimulating volume entitled *Their Country's Pride: An Anthology of Rural Life Literature*. The idea for the anthology, first of its kind, according to the publishers, was born in the mind of Msgr. Luigi G. Ligutti, founder of the Granger Housing project of Granger, Iowa, and a long-time promoter of the back-to-the-land movement, who contributes a "Foreword" to the book.

"Intended primarily as a teaching aid, to be used in rural and urban schools," the anthology, Msgr. Ligutti points out, "can also be used by the general reader, or in sociology classes, or as source material for sermons, or in each of a dozen other ways." It is interesting to imagine the classroom groups that would use and discuss such a book, and it is indeed pleasant for the "general reader" who writes this page to recall his at-home perusal of this one and the delight of others in his home who have likewise been reading it. It is apparent that not all general readers will share the religious convictions to which the book is faithful, yet it seems to this reader (who himself falls in that group) that contemplation of the values here religiously presented is certain to be edifying, perhaps even beyond the objectives of the volume.

The Rev. John La Farge, S.J., for example, writing of the Granger Housing project, emphasizes the Christian family philosophy. Father La Farge sees the Granger Homestead as an embodiment of the idea that "the most direct route to a solution of the vexed problems of livelihood in this world is an uncompromising insistence upon a home life which places first and always God and the interests of the world to come." He also sees this project (a resettlement or homestead plan for miners) as emphasizing that "close contact with the land and familiarity with the living things that spring from the land is the natural habitat of the miner's or the industrial worker's family quite as much as that of the farmer himself. The whole nation, in all its diversified occupations," declares Father La Farge, "needs to learn the Christian rural philosophy. It is not just a specialty of the professional food-suppliers."

Many Christians who are not of Father La Farge's communion will share his zeal—and that of these anthologists—in such an emphasis, and still others will doubtless with him see as "natural habitat" that which affords "close contact with the land and familiarity with the living things that spring from the land." Henry Beston, for example, in the also recently published *Northern Farm: A Chronicle of Maine*—which, however, does not reveal the author's church affiliations, or that he has any—asks a question in his opening paragraphs that has obviously been posed to Father La Farge also. "What," asks Mr. Beston, "had gone out of American life as one sees it in the city

and the suburb?" His own answer at the moment is broad: "Essentially, thought I, musing by the window, a sense of direction." In a three-paragraph reflection that concludes another of the forty-six parts of his bucolic book, Mr. Beston says:

"How wise were the ancients who never lost sight of the religious significance of the earth! They used the land to the full, draining, ploughing, and manuring every inch, but their use was not an attack on its nature, nor was the ancient motherhood of earth ever forgotten in the breaking and preparing of the soil.

"They knew, as all honest people know in their bones, that in any true sense there is no such thing as ownership of the earth and that the shadow of any man is but for a time cast upon the grass of any field. What remains is the earth, the mother of life as the ancients personified the mystery, the ancient mother in her robes of green or harvest gold and the sickle in her hand.

"When farming becomes purely utilitarian, something perishes. Sometimes it is the earth life which dies under this 'stand and deliver' policy; sometimes it is the human beings who practice this economy, and oftenest of all it is a destruction of both land and man. If we are to live and to have something to live for, let us remember, all of us, that we are the servants as well as the masters of our fields."

Neither of these books, however, is adequately represented by emphasis on the rationales of their preparation, although taking the works thus seriously does seem properly creditable to the authors. Mr. Beston remarks in one connection that "a sense of joy in living is one of the most serious things in all the world." His chronicle is essentially that of one who has found a satisfying way of life in a machine world that "has given us conveniences (often

most uncomfortable) and comforts (often most inconvenient)" but has never had "human happiness . . . on its tray of wares." Forty-six times in this book he presents us with a descriptive narrative of his Maine farm life, a reflective essay, and between them a brief "Farm Diary." (Item: "Fell asleep listening to a murmur of rain, first having put a stick of oak on the bedroom fire.") It teases one not to know why there are only forty-six and not the fifty-two that would make them seem weekly. They are chronological in their sequence.

There is not here the testimony of labor on the land and of farm living that Elliot Merrick so recently wrote into *Green Mountain Farm*, nor the contagious vitality that Mr. Merrick breathed into his work. This rather is a book of the charming, the picturesque, the significant observations and perceptions of one who seems enabled to live on a northern farm in the way that most of us would choose. It is more to be read a part at a time (as it seems to have been written) and its sententiousness pondered as one might the texts for his own musings, its incidents and descriptions enjoyed as one remembers at evening a refreshing experience told by a companion at lunch.

*Their Country's Pride* is, of course, likewise, like all anthologies, a book to be enjoyed in its parts. Interesting as was the first consecutive reading of this reviewer, the subsequent re-readings here and there of the procrastinating writer have been still more enjoyable. Many of the selections are, in fact, too intense in their representations of nostalgia, drama, humor, beauty, or other emotions aroused by rural literature to be read one

## On First Seeing the Forsythia in Bloom

By GERHARD FRIEDRICH

Here has the gentle miracle of May  
Become a sudden and accomplished thing.  
While wintry gusts still send across the bay  
Their intermittent challenge to the spring,  
These tiny flags unfurled, with perfect grace,  
And are a vision gladly to be seen.  
And many a cherished hope the heart can trace  
In blossoms that appear before the green.

This brightly burning bush of yellow flame,  
These sunlit shoots, this petaled pantomime,  
Proclaim anew the spirit without name.  
Here life eternal blossomed into time,  
And stores of hidden beauty are unbound:  
The place on which I stand is holy ground.



after another rapidly. Essays, fiction, and verse are all included. Each selection is prefaced with a short identification sketch that evaluates the author and the excerpt, and "kindred readings are grouped in sections under appropriate headings." There are eleven such groupings, including one on "Conserving Our National Resources" that seems woefully inadequate. Best representative of the volume, perhaps, is that entitled "Nostalgic Rural Scenes and Adventures," prefaced by:

"The born inhabitant of the city takes keen delight in a walk into the country such as Hazlitt describes in this section, but his enjoyment does not last. It is principally the change from the crowded city which rests and pleases him. The scenes themselves make no special appeal to his inner self.

"How different the effect on another who has either been born and bred in the country, or who has actually lived for some time on a farm and who has perhaps been away for some time. A stile, a faint odor of wild crab-apple blossoms, a shady country lane, a creek—any familiar sight which he has carried in his mind since childhood strikes a vibrant note in the chords of memory, arousing associations dear to his heart.

"Such homely scenes must be lived to give lasting joy. Bringing in a new calf is not such a great pleasure at the time. The same is true of being aroused from a warm bed at midnight to drive the cows out of the cornfield. These scenes possess the mysterious power of arousing a pleasing nostalgia when they are brought to memory in other years."

Besides Hazlitt the authors represented in this group are Robert Frost, St. John de Crevecoeur, John Milton, Marguerite Wilkinson, Christopher Morley, Georges Bouchard, Theocritus, Shakespeare, Elizabeth J. Coatsworth (who, incidentally, is Mrs. Henry Beston), Peter McArthur, Carlyle, Gerard Manley Hopkins, and Sister Pascal herself, who contributes a poem entitled "Transplanted":

I like to think of daisy fields  
Where laughing children play  
Who freely pluck the petaled heads  
And carry them away.

I like to think of winding creeks  
With sandy shores where boys  
May lie upon their backs and dream,  
Away from dust and noise.

I like to think of country roads  
Where brown-eyed Susans grow—  
And meadow pinks and roses  
And common flowers I know.

I like to think of apple trees,  
Not young in rows complete,  
But old and spreading near a door  
And showering petals sweet.

What different scenes I daily view!  
Sky scrapers, gaunt and gray,  
Crowded streets and noisy trams—  
Where night turns into day.

Daisies? Yes, in city parks  
In beds precise and trim,  
Or bordering artificial ponds  
To gratify a whim.

Past them and crowded thoroughfares  
My truant fancies flee  
To memory vales landscaped by God  
Where daisy fields are free.

These verses are more profound than they may seem, for the majority of us in this so urban civilization have in truth been transplanted. Our happiness and welfare are more dependent than most of us realize on our "memory vales" and on our excursions into wild surroundings. It is indeed good to emphasize the values of rural opportunities in year-round living, and many there are who would be foolish to desert them. Increasingly numerous, however, are those who more and more vary from this happy medium of living toward the urban extreme that in turn must for natural joy and wisdom be balanced by an occasional resort toward the other extreme of the true wilderness. *Their Country's Pride* and *Northern Farm* are among the books that quicken our sense of such a need—a need that is keenly expressed in the closing sentences of *Northern Farm*, which under the continuing influence of the anthologist I cannot refrain from quoting, in conclusion. Says Mr. Beston in "a statement of a country man's unchanged belief":

"... What has come over our age is an alienation from Nature unexampled in human history. It has cost us our sense of reality and all but cost us our humanity. With the passing of a relation to Nature worthy both of Nature and the human spirit, with the slow burning down of the poetic sense together with the noble sense of religious reverence to which it is allied, man has almost ceased to be man. Torn from earth and unaware, having neither the inheritance and awareness of man nor the other sureness and integrity of the animal, we have become vagrants in space, desperate for the meaninglessness which has closed about us. True humanity is no inherent and abstract right but an achievement, and only through the fullness of human experience may we be as one with all who have been and all who are yet to be, sharers and brethren and partakers of the mystery of living, reaching to the full of human peace and the full of human joy."

*Northern Farm: A Chronicle of Maine.* By Henry Beston. New York and Toronto: Rinehart & Company, Inc. 1948. 246 pp., with 47 chapter-head drawings by Thoreau MacDonald. \$2.75.

*Their Country's Pride: An Anthology of Rural Life Literature.* Compiled and edited by Sister M. Pascal Campion, O.S.F. and Sister M. Bede Donelan, O.S.F., Milwaukee, Wis. The Bruce Publishing Company. 1948. 482 pp., with frontispiece photograph by Harold M. Lambert, foreword by L. Ligutti. \$3.75.

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Devoted to the Practical Conservation of the Great National Resources of America

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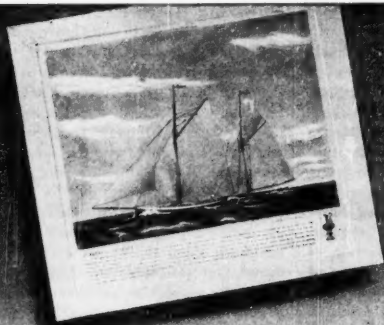
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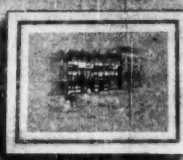
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## NATURE AND CONSERVATION IN THE BOY SCOUT PROGRAM

By TED PETTIT

NATURE and conservation have been an important part of the Boy Scout program since its inception. In fact, many professional naturalists and conservation technicians got their start, or developed their interest, as Scouts or counselors in Boy Scout camps. But a study of the Nature and conservation program during the last few years has shown the need of making Nature and conservation a more practical part of the program in the eyes of a boy.

The Scout program is built around a series of experiences—fire building, cooking, first aid, hiking, camping, and the like—the completion of which leads to advancement in rank. A boy enters Scouting as a Tenderfoot and advances, by completing certain projects, through the ranks of Second and First Class. Then, by earning certain Merit Badges, some optional and some required, he may advance through the higher ranks of Star, Life and Eagle.

For the first thirty-five years of Scouting, a boy was not required to complete any projects in Nature or conservation until he began working for First Class. Then his project was to identify 10 species of trees; or six species of birds; or six species of "wild animals."

Upon reaching First Class, and in working toward Eagle, he was required to earn the Bird Study Merit Badge (chiefly identification); and, if interested, he might explore the fields of rocks and minerals, insects, botany, reptiles and zoology, earning badges in those fields. In the conservation area, he might, if he desired, earn badges in conservation, forestry, or soil management.

The study of the program revealed that the wording and the form of the requirements resulted in Nature and conservation being subjects in themselves, totally unrelated to true-to-life experiences such as hiking or living in camp. The end of the program tended to be solely the identification of plants and animals. Of course, there were exceptions, and many fine programs were developed. But the average experience of the average boy in Nature and conservation left much to be desired.

In 1946 new basic requirements for Tenderfoot, Second and First Class went into effect. Now, every boy, before he becomes a Tenderfoot—before he becomes a Scout—must meet this requirement:

"Explain what care should be taken be-

fore building a fire in the open. Describe the harm to a live tree that results from hacking it with an axe or other sharp tool."

The intent of this requirement is obvious. It is felt that, as more boys go through Scouting, and go into the outdoors as men, fewer forest fires will result from carelessness. It is felt that fewer eyesores, and dead or dying trees, resulting from aimless hacking, will be found in the parks and woodlands of America.

Before he becomes Second Class, every Tenderfoot must meet these requirements: "... show to the satisfaction of your leaders that you ... take care of your Country's natural resources." And as for wildlife, must "Find evidence in natural surroundings, of at least six different kinds of wild mammals, birds, reptiles, or fish. Identify them."

The purpose of the first requirement is a follow up on the Tenderfoot requirement, and is also an effort to stimulate Scouts to complete other projects in the field of conservation. The aim of the Wildlife requirement is to stimulate troop activities and individual interest, not only in the animals themselves, but also in their relation to their environment—the same environment in which the boy finds himself as a camper or hiker.

Before becoming First Class, a boy must "... show to the satisfaction of his leaders that he ... takes care of his Country's natural resources. Find and identify ten different kinds of trees or shrubs. Tell their uses. Find and identify four different edible wild greens, roots or fruits."

Again the intent of the first requirement is to follow up the lower rank requirements, and to stimulate further projects in conservation. The last two requirements are planned to arouse interest not only in knowing trees, shrubs and other plants of the natural area in which he camps, but also in knowing the use of these plants for soil or water control, food or cover for wildlife, commercial uses, wind breaks, emergency food for man, etc.

In general, the new requirements are all within the grasp of the average twelve-year-old boy, and well within the grasp of the average leader. But more than that, they aim at stimulating interest in developing projects and group activities that are a natural part of outdoor living, a natural part of a boy's experience in camping.

In line with the revision of the basic requirements, the Merit Badge program is now under intensive study. At this writing, no final decisions have been made, but certain proposals have been developed for the realignment of all badges.

Present badges are Bird Study, Botany, Insect Life, Reptile Study, Rocks and Minerals, Zoology, Conservation, Forestry and Soil Management. Proposed badges

to replace the present set up are Water Life, Marsh Life, Field Life, Forest Life, Desert Life, Forestry, Wildlife Management and Soil and Water Management.

Under the proposed plan, a boy would be asked to select a natural area near his home or camp—pond, marsh, etc.—and find out what factors (climate, soil, water) were responsible for the area being what it is. He would make a simple survey of the plant life in the area and the animal life living there.

Next, he would be expected to carry out one or more projects to help him find out more about the plant life—not only names, but something of their life histories. He would be asked to specialize in one form of higher animal life (mammals, birds, fishes) and find out something of how they live and how they fit into their environment.

Finally, he would survey the area from a conservation point of view and carry out, if necessary, one or more projects.

It should be said here that a Merit Badge is not designed to make a boy an expert in a subject. Its purpose is to expose him to certain projects, under adult guidance, through which he may become sufficiently interested to carry on further exploration by himself. These requirements would be geared to the 12- or 13-year age level, and be elementary.

There would necessarily be overlapping of subject matter in the three conservation badges, but a boy would have his choice of any or all three, depending upon where he lived, his natural interest and the availability of adult guidance.

It has been proposed that one of the "natural life" badges be required for Star or Life, and one of the conservation badges be required for Eagle Rank.

It is recognized all too well that requirements alone cannot "make" a good Nature and conservation program. Too much depends upon the attitude, ability and interests of local leaders. But requirements certainly can help take the emphasis off identification as an end of the program, and play up, instead, the interrelationships between plants and animals in a natural area; and can help to stimulate the development of boy-interest programs that are a natural experience in the open.

It should be said, too, that the efforts being made in the advancement program to stimulate interest in conservation are far from being the only activities of the Boy Scouts of America in conservation education. A wealth of other activities include leadership training, troop and camp program activities, the production of films, publications and training aids, etc.

Reactions to this proposed program are earnestly sought by the Boy Scouts. Critical comments are desired, especially from workers in the fields of conservation and natural history. They may be addressed to the writer, Boy Scouts of America, 2 Park Avenue, New York, 16, N. Y.



## WHAT IS MY NAME?

By SUE WYATT-SEMPLE

**FIRST CLUE:** When I was merely a ball of puff, I was adept at "freezing": at a word from my parents, I would instantly flatten myself on the ground beneath a dead leaf, a twig or a wisp of grass, and presto! disappear as if by magic. Nothing was alive except my tiny, watchful eyes; and nothing could induce me to move until there came the reassuring notes from one of my parents. What is my name?

**SECOND CLUE:** This ruse of remaining rigidly stationary until danger is past, I have found to be most effective. Being such an elusive creature, therefore, I have puzzled many a wild prowler in search of a meal; and I have challenged the wits of sportsmen in a very special test—so perfect is my protective coloration and concealment. What is my name?

**THIRD CLUE:** I am a musician and I play in a great outdoor symphonic orchestra. I constitute a part of the life and drum corps of the woods. No other orchestra contains a member who can drum without a drum as I can. Too, I have the special honor and distinction of being the official state bird of Pennsylvania. What is my name?

**FOURTH CLUE:** In mating time, I strut before my sweetheart and exhibit to perfection my glorious fan-shaped tail and my splendid black neck-ruffs. I prefer a fallen log, a stump, an old rail fence or a stone wall to use as a "drumming stand." With a jerking, dandified gait, I puff out my fine feathers, ruff my neck frills, raise and spread my tail like a turkey cock, and then suddenly halt and begin to beat my wings. What is my name?

**FIFTH CLUE:** My drumming is one of the most mysterious and puzzling sounds of the forest. It may be mistaken for low, distant thunder or any far-away rumbling of unknown origin. After a few slow measured thumps, my stiff strong wings whirl faster and faster, until there is only a blur where they vibrate in a rolling tattoo. This is my love-song that summons my mate to our trysting place. What is my name?

ANSWER: Ruffed Grouse

### British Birds

*Birds in Britain.* By Frances Pitt. London. 1948. Macmillan Co., Ltd. Illustrated with 17 color plates and black and white. 576 pages. \$7.25.

This is the fourth book in the "In Britain" series, the earlier three having dealt with flowers, trees and dogs. This volume, the author recognizes, adds to an already large list of British bird books, but she feels that there is a place for yet another "survey of the bird life, wild,

feral and domestic, in Britain, which would tell concisely of their status, appearance and habits, with the special view of assisting the recruit to the study of ornithology." After preliminary discussion of the bird's place in Nature, its structure, distribution, migration and behavior, Miss Pitt treats with the birds by families. Her descriptions are complete, yet informal and readable, full of the pleasures of bird study, which the author enjoys immensely and is, therefore, able to impart to her readers.

### Stone Mulching

*Stone Mulching in the Garden.* By J. I. Rodale. Emmaus, Pa. 1949. Rodale Press. 164 pages. Illustrated. \$3.00.

Using stones as a garden mulch would seem to be a most cavalier treatment of the garden, but it appears that it is a practice that dates back some two thousand years and has been forgotten. Trust J. I. Rodale, however, to dig up anything that is different in the garden line, and he has done so in this interesting discussion of horticultural practice. The affinity between stones and the health and success of garden plants seems to be closer than most of us would think, and the garden pioneer and experimenter will find a whole new field fascinatingly suggested for exploration in this volume.

### Bay State Insects

To try to cover any appreciable number of insects found in Massachusetts within the compass of a little, 22-page booklet would, of course, be impossible. This Henry Curtis Ahl, R.F.D., Rowley, Massachusetts, fully recognizes, but he has prepared a little pamphlet entitled "Some Common Insects of Massachusetts" to describe some of the insects most interesting because of their coloration, size, habits, or associations. Copies are available at 25 cents each, postpaid.

## A New Theory of HUMAN EVOLUTION

By SIR ARTHUR KEITH

EVER since man's kinship with the apes was recognized, there has been controversy over the nature and habitat of his pre-human ancestors and the causes which led to their evolution into *homo sapiens*. Now Sir Arthur Keith, in a book finished, as he tells us, on his eighty-first birthday, gives us the results of his years' study of these questions. \$4.75

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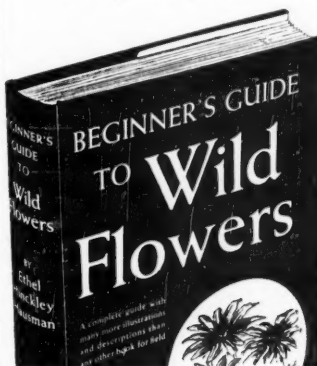
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# The School Page

By E. LAURENCE PALMER

Professor of Nature and Science Education, Cornell University, and Director of Nature Education, The American Nature Association

## PEAT BOGS IN SCHOOL

**W**HILE it is quite improbable that peat bogs may be available for direct study by most schools in the country, there is probably not a school in the country that does not depend in some way on the products of peat bogs of the past. And there is probably not a school that cannot easily procure some raw materials that may have come from a peat bog.

If a bog is not available, visit some plant nursery, or, possibly, some flower shop to see if you cannot get some peat moss such as is commonly wrapped about plants being shipped long distances. The moss is used, of course, because it holds moisture for a long time, and keeps the roots moist where they would otherwise become dry and dead.

Once you have some peat moss, try as many experiments as you can think of to discover how much water it can take up in relation to its dry weight; how long it can retain an appreciable amount of this water in contrast with a sponge, cotton, wool, paper, blotting paper, or other absorbent materials. You do not need any elaborate apparatus to carry on this study if you will merely weigh out units of equal weight on a simple balance, and then test the relative amounts of water taken up and lost under the conditions you may see fit to impose. These studies may give you some basic appreciation of the value of these plants in bogs where there is, possibly, "water, water, everywhere nor any drop to drink" so far as most plants are concerned.

Should your school be in a region where a peat bog may be visited you should, of course, make the most of the opportunity. When I visit a nearby bog with my classes I usually try to provide myself, before going onto the bog, with a handful of matches and a good strong stick picked up in a nearby woods. Once on the bog we usually thrust the stick as deeply as we can into the bog. Then, before drawing it out, we light a match and hold it near the stick and the bog. When the stick is drawn out there is frequently a rush of gas that catches fire and burns with a clear, hot flame. Sometimes we take a shoe-box, such as was used to carry a lunch. We turn this box bottomsides up in the water of the bog so that it is completely filled with water. Then we thrust our stick into the bog as close to the box as possible. When we draw the stick out we move the box quickly over the opening to collect the gas in the box by the water-displacement method. Once we have found a place where gas may be had, we can get a fair supply in our box. Then if we tear off a corner of the box and light it quickly we can get another flame from a more sustained volume of gas.

The article on "A Peat Bog Log" elsewhere in this magazine provides in its tabular material some data that may be useful in understanding the role peat bogs play in the development of the coal measures of the country. Consideration of this part of the story must find some place in the usual geography program. But a study directed solely to understanding something of how coal is formed is of little real value if it does not lead to some habits that contribute to a wise use of this valuable natural resource. Academic gymnastics may be sufficient to get one through a class, but in themselves they do not contribute much to a better world in which to live. In other words, please do not spend a whole period teaching about how coal and similar products might develop in a manner similar to what you see going on in a peat bog and then open a window and waste heat produced by coal.



A typical peat bog area rich in possibilities for study.

The school may care to try to make collections showing the changes that might take place in organic matter that might find a climax in the form of anthracite coal. The series might include fresh, growing plants from a peat bog, dried plant material collected at different depths below the surface of the peat bog, peat, lignite, bituminous coal and anthracite coal. It may be worth while to make an attempt to dry some of the submerged material to be found in a peat bog to see what sort of fuel it would make. Does it burn brightly, easily, smokily, quickly or otherwise? Does it leave a good bed of coals, or does it seem to leave little or no ash? If it is burned on a metal plate such as a tin pan, does it leave any residues that seem to be like tar, and, if so, does it differ in this respect from other fuels easily available for experimentation?

If there are any of the so-called carnivorous plants, such as pitcher plant and sundew, available for study, try to make the studies in the field, leaving the plants where they are instead of taking them into school or home laboratories, where they will, in all probability, die. So many books tell you about how these plants capture insects for food that it may be fun to try to see what you can learn for yourself about it. Put some grains of sand and some small particles of meat on a gland-covered leaf of sun-dew to see if similar responses are observed. Look through the liquid found in the leaves of a number of pitcher plants to see if you can find any that contain living and active mosquito larvae. If you think that the presence of particles of dead insects in this liquid indicates that the insects were deliberately killed for food, then hunt around for some other containers in the bog to see if you cannot find a tin can, for example, that is equally as deliberate in its destruction of unwary insects as is the celebrated pitcher plant. If you feel like having a little fun, have the children write an imaginary story telling how the tin can sought and procured insect food for itself, using as a model for the essays the account you can probably find in almost any encyclopedia available for use by children or by the lay public.

If you are in a part of the country where peat bogs are relatively common, try to collect from interviews any stories that tell of accidents that may have occurred when things sank in the bog. It may be nothing more than a cow, or it may be a highway, a railroad or even a state capital.

Study the photograph of a bog shown elsewhere in this magazine. In the center of this particular bog is the old, unclosed pool surrounded by the ring of sphagnum, leatherleaf, cranberry and similar plants. In this particular bog there is an outer moat that is not surrounded by the usual bog plants, so in this bog you have more than is to be expected in the typical peat bog. Its story is one that always intrigues those who have the chance to visit it. This bog used to be just within bicycling distance from my school when I was a youngster, and I have seen it at most times of the year and it was always interesting. I used to figure that if I could get out to the bog after school I would have had a real trip, even though it meant that I probably had to ride home in the dark.

# Contents Noted

SOME day, we have been promising ourselves, we are going to crawl right out on a limb and write a piece evaluating the various magazines published by State fish and game or conservation departments. These publications have been coming to our desk for years. We have watched some of them evolve from a compendium of hunters' exploits, with a multitude of pictures of nimrods and their bags of game birds or mammals, to publications with a true conservation punch. A few still linger in the dark ages editorially, but the majority now take the broad view of conservation and seek to educate the holders of hunting or fishing licenses, who are their main readers. Until we get to that promised article, and without implying any invidious comparisons, we would like to make a preliminary bow in the direction of *North Dakota Outdoors*, publication of the State Game and Fish Department at Bismarck. Edited by Alice Latimer, this publication is among the best, in which group we would also place Missouri, Virginia, Pennsylvania, Minnesota, Wisconsin, Iowa and New York.

WITH its March, 1949, issue *Sports Afield* completed a series of articles by Bill Wolf under the collective title of "Running Sores of Our Land." This has been a significant series that must have aroused the readers of this publication, which admits to being the "world's largest sportsmen's magazine." This series of articles is worthy of republication and wide distribution where it will reach that larger body of people who do not fish or hunt but which needs some good, tooth-jarring jolts. Hunters and fishermen, if they know where the butter is on their bread, had better get busy doing something about these running sores, and many of them are. But there is a greater uninformed and indifferent population that has fully as much at stake in this "sick land" that Bill Wolf describes. *Sports Afield* has reprinted the final article, in which the author of the series proposes the remedy to cure these sores. We hope that the editors will not take it amiss if we suggest you write for a copy to *Sports Afield*, Minneapolis 1, Minnesota.

SENATOR McGrath of Rhode Island has introduced a bill to amend the Act "to prohibit the killing of wild birds and wild animals (sic) in the District of Columbia," to permit the killing of starlings. Just how this starling vendetta is to be accomplished is not specified, and all earlier attempts to discourage the birds have been failures, including stationing unemployed in depression days in trees where they banged on tin cans. And if shot starts flying in downtown

Washington, glaziers should have a field day. There is no doubt that these imported birds are a nuisance to autoists parking their cars under trees in which the starlings roost, but we cannot but feel that this nuisance is balanced by the avidity with which the birds gobble up Japanese beetle grubs and adults. There is a further danger in such legislation, as indicated by an incident in Chicago. A newspaper writer had attacked the starling, urging a drive against the birds. Shortly afterward a large flight of purple martins, one of our most valuable insect-eaters, arrived. Thinking these birds were starlings, old and young pelted the perching birds with rocks, shot at them with air rifles, and killed many birds.

WHEN the New York State law prohibiting the sale of the plumage of wild birds in the United States was enacted, the feather trade was given a liberal period of years in which to dispose of feathers that it then claimed it had in stock. The period of grace expired during the war period, and the industry pleaded that war conditions had not permitted them to liquidate their stocks as rapidly as they had anticipated. Accepting this plea, conservationists, led by the National Audubon Society, voiced no objection to a further grace period of three years, having the assurance of the spokesman of the industry that no further extension would be sought. In renunciation of this promise, the feather industry is promoting Senate Bill No. 606,1528 and Assembly Bill No. 986 in the New York Legislature, providing an extension until 1953. Time and patience have run out. The feather trade has had time enough; conservationists patience in plenty. Every conservationist and bird lover in New York should see to it that their Senators and Assemblymen are advised to vote *against* this amendment to the plumage law.

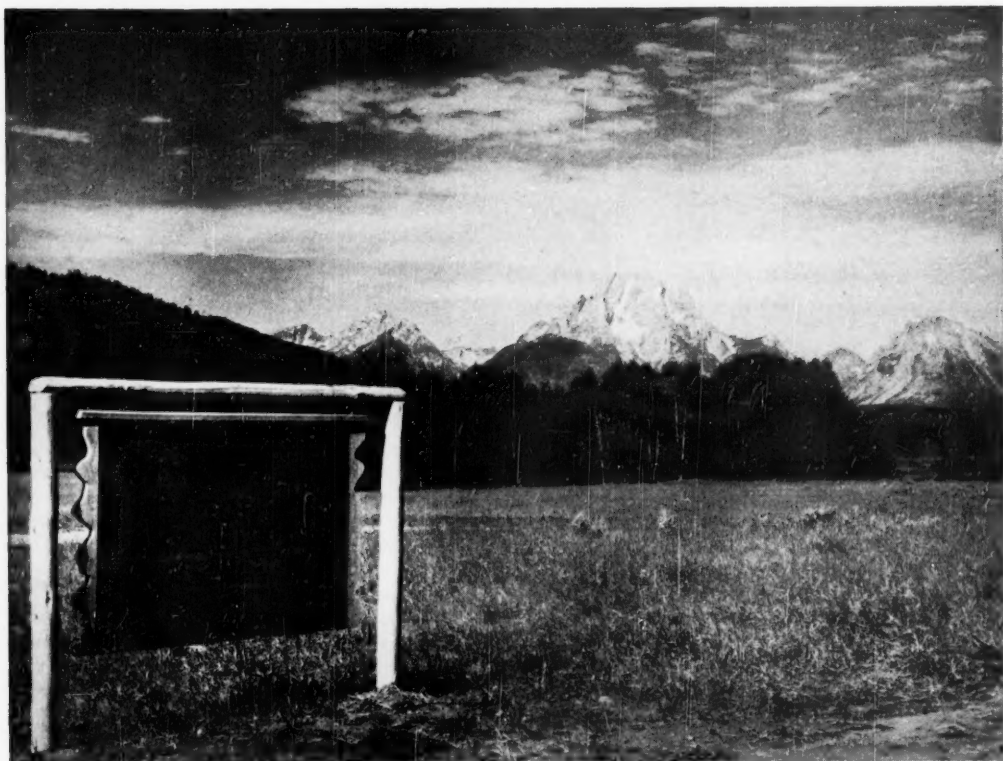
SOMEONE seems always to be taking the joy out of life. For a long time artists have depicted the falling raindrop—and the shed teardrop—as a sleek globule, pendant and stream-lined. This conception has also given inspiration to designers of many things, not the least of which is our current automobile. Now come the scientists of General Electric Company, who have been spying on the raindrop as it makes its damp and unsuspecting way toward the earth. They come forward to assure us that these drops are unkempt and uncouth affairs, physically. They produce photographic evidence to support this discovery, and conclusive evidence it is, too. We venture to predict, however, that it will take a long time to get the globular raindrop out of cartoon and comic strip, which probably will not trouble General Electric's scientists at all.

R. W. W.



Close-up of a four-month-old pronghorn antelope in the sagebrush areas of the Wildlife Park. This animal interested all the movie makers, because it had three distinct modes of locomotion and could change from one to the other while frisking around. It walked in the usual way—hind and fore legs of one side alternately coming together. It hurried by jumping stiff-legged, all four legs simultaneously—a gait which carried it rapidly over the stiffer sagebrush and to safety. But when it really ran, the gait was almost rabbit-like, with hind legs spread and front ones together. The hind pair passed the fore on each side simultaneously and threw the creature forward like an animated tripod.





An attractive sign beside the information booth on U. S. Highway 287 (Riverton to Moran) draws the attention of the traveling public to the bison and elk herds visible from this point during most of the day. Many visitors digress here to drive down one of the Park roads leading to even closer proximity.

## Wildlife Wonderland

By LORUS J. MILNE and MARGERY J. MILNE

*Photographs by the Authors*

**W**E HAD field-tripped over a great part of the western states before that morning in June when we stopped for gasoline, northbound in Jackson, Wyoming. A national park lay before us, and we were curious to know the basis for the description glowing in the guide book. But the native attendant answered all our questions without giving us much idea of what to expect. To him the scenery was just Jackson Hole—one of those level-bottomed valleys between mountains that are so numerous in the glacier-scoured areas of America.

Swiftly we approached the village of Moose, and suddenly, in the west beside us, arose the most spectacular snowclad peaks we had ever seen. We gasped in delight and disbelief as the lofty Tetons glistened in the noonday sun, like an imaginative backdrop or

a painting. Nor did the illusion vanish on closer inspection; it was no mirage. Those jagged peaks lost none of their sharp beauty when we climbed to one vantage point after another. And the variety of interesting, unexpected animals and plants unfolded like a magic carpet wherever we explored. How we regretted the tight timetable that limited our stay to a few days! The place seemed a naturalist's paradise.

At Christmas time, later that year, we were in Chicago at science meetings when news reached us of a new wildlife park in process of organization—in Jackson Hole. Post-haste we wrote for information, and underlined our enthusiasm for the region. Back came an invitation to return in the summer of 1948, to study and photograph the creatures that populate this valley—still so nearly in the undisturbed state of gran-



Three trumpeter swan cygnets, closely guarded by their stately parents, head northward shortly after dawn to enter a marshy patch in the Federal Elk Refuge near Jackson, Wyoming, at the southern end of Jackson Hole. Each night they return to feed between highway U. S. 187 and the Refuge fence.

deur the Indians knew before the white man came.

Loaded down with a carful of camera equipment and heavy clothes, we arrived a few weeks before the formal dedication of the Park on July 19. Late snows, it developed, had delayed the construction program so much that only the laboratory building was ready. No matter. We dug out our camping gear and soon were comfortably settled in a tent. Yet, early as we were, the short summer of the high valley was already well along. Fields were spread butter-yellow with western sunflowers, flecked here and there with scarlet *Gilia*, while the orange-red of Indian paintbrush emphasized the shadows among the aspens and willows. Before long, snows, which still stood in shrinking drifts at nine thousand feet elevation, would no longer be a source of melt-water moisture adequate for a thriving valley vegetation. Color would fade, and most animals would flee from the sagebrush flats to the higher slopes.

Jackson Hole, our "valley of the picture-book mountains," is a broad area extending north to Yellowstone National Park between the spectacularly abrupt Teton, to the west, and the Wind River range, to the

east along the continental divide. The valley is a fault trough left when the massive Teton rose, later excavated by glaciers and by the Snake River and its tributaries, which wind along the bottom land. The area slopes from about 7000 feet elevation in the north to a thousand feet lower at the south, in the shadow of eleven major peaks—several of them reaching an altitude of over 13,000 feet. Yet Jackson Hole is not merely a scenic companion piece to the Grand Teton National Park. It is a wildlife center of America, in both numbers and varieties of rarer animals. This dual basis was the background for a Presidential proclamation, in 1943, creating the Jackson Hole National Monument "to preserve both a mountain range and valley that are one in framing a landscape of grandeur and majesty unique in America, and to protect the dwindling big game animals of the area for future generations to see."

Unfortunately, only about four-fifths of the Monument area is federally owned, and some of the small population on the privately held tracts vigorously oppose the successful operation of the conservation effort. A few are cattle men. Most vociferous are the

Part of the bison herd that thrives on the great pasture in the Wildlife Park. It is often difficult to impress on the public that these huge animals are still wild, since they pay so little attention to human movements or to cars on the observation road. Only the calves seem skittish, yet terror strikes the whole herd and they may stampede if visitors give the impression of surrounding them or blocking their route.



**A young prairie falcon, partly feathered out, waiting for dinner to be brought from the mess hall by one of the investigators. This bird was socially unpredictable, and took one blood-letting bite out of the photographer who tried to get it into a better pose.**

self-styled "sportsmen" who are eager to retain their present legal right to slaughter the elk as they migrate down from the summer feeding grounds into the Federal Elk Refuge located just north of the town of Jackson at the lower end of the Hole. This annual spectacle has given rise to public indignation across our land. That it is allowed to be repeated, and on a National Monument area too, shows clearly that some step in the democratic process is being abused.

During the Coolidge and Hoover administrations, John D. Rockefeller gradually acquired twenty-two percent of the Jackson Hole land not in Federal ownership. This was looking to the consolidation of the entire area. Some 900 of these acres, plus 600 acres of Federal land, now make up the 1500-acre tract now known as the Jackson Hole Wildlife Park, a non-profit Wyoming corporation, sponsored by the New York Zoological Society, the Jackson Hole Preserve, Inc., and the Wyoming Game and Fish Commission. The Park makes possible the exhibition, in their natural surroundings, of such important large animals as elk, or wapiti, Shiras moose, pronghorn antelope, western white-tailed deer and bison. It operates also as a biological field station, with facilities available to colleges, universities and



natural history institutions whose personnel wish to study the wildlife of the Rocky Mountain area.

The Wildlife Park itself lies immediately east of



Weasels are numerous in the Park area. Several times one came up to the foot of a photographer sitting quietly in a sheltered spot, waiting for a picture of some other animal. This specimen was cornered in daylight and became a willing model in only one particular. It bit savagely at anything extended toward it, and even advanced silently toward the photographer, several steps at a time, to knife its teeth toward him. He was glad the weasel was no larger than a squirrel; such a creature would be dangerous if a few times bigger! Nor did weasels kept in captivity lose their ferocity—even toward the hand that fed them.



Three moose in one photograph is something of a record—even for Jackson Hole. Here a cow moose (right foreground) faces one young bull feeding at the water's edge (extreme left) while another young bull browses on willows a few dozen yards beyond the cow. These animals were wading in beaver ponds near Moose, Wyoming, a little south of the Wildlife Park but still in the same valley area.

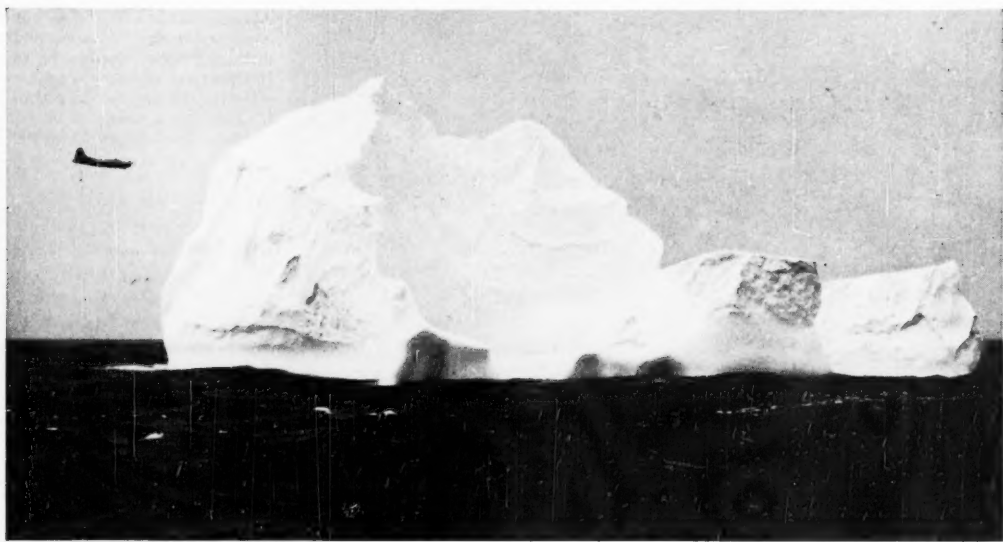
the summer colony of Moran, and is bounded by the Snake River on the south, Pacific Creek on the east, U. S. Highway 187 (Jackson to Yellowstone) on the west, and U. S. Highway 287 (Moran to Riverton) on the north. In this compact, invisibly fenced area is a remarkably varied habitat, with solid as well as scattered stands of lodgepole pine, dense willow areas, sedge-bordered ponds and marshes, sagebrush slopes, groves of quaking aspens, and flat, well-drained grasslands. Springs, ponds, backwaters of the meandering Snake River, and the fast water of the Snake itself add variations. From the highway and special Park drives, the public can inspect these habitats and see in them the many animals each supports.

Visitors to the Jackson Hole Wildlife Park are greeted at the log-cabin type information booth on U. S. Highway 287, and directed down various of the Park roads to see the free-roving herds. From the booth area there is a grand view across grasslands toward the Snake River and the Tetons. Here a score of shaggy bison emerge from the pine groves each morning, to graze in full view of the traveling public. Around noon the animals take a cud-chewing siesta,

often in the field, where lying in the grass they look like so many dark brown boulders. More feeding—sometimes accomplished at a rapid walk—precedes their return, toward sunset, into the shelter of the trees, where they can take frequent dust baths in shallow depressions of the bare earth beneath the pines.

Some people have great difficulty in believing that these animals are really wild ones, imported from Yellowstone National Park. They fail to realize that the bison are free and that human activities should be restrained. A few want to walk right up to the shaggy beasts to get a picture—usually in the shade. Others wish their children to stand beside a buffalo, and seem annoyed when the Park staff warns them to keep at a distance. The bison do tolerate visitors surprisingly well, but each animal keeps an eye on their antics. Only when cars and people accumulate and threaten to surround a herd, or block its feeding route, do the animals show sudden terror and a tendency to stampede. Watching them, one wonders how similar their behavior is now to years ago when these animals numbered in the millions and were a familiar sight, not just in Jackson (Continued on page 242)





Beautiful but menacing, an iceberg in the North Atlantic. Air and surface operations, combined with the use of radar and loran, provide vital information on the position and drift of these ice masses and data are broadcast twice daily to ships in the danger area.

## Icebergs—Majestic Menace of the Sea

By EUGENE W. NELSON

*U. S. Coast Guard Photographs*

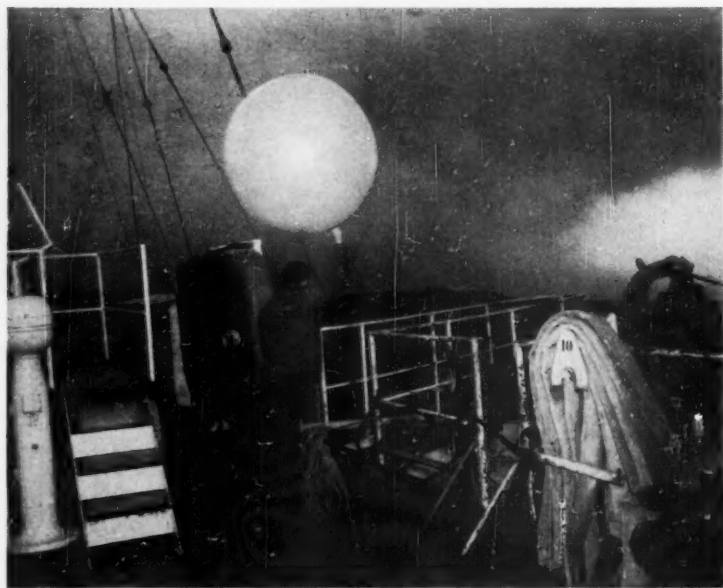
**T**HERE are few objects in all the great realm of Nature that are as beautiful, or as dangerous, as those floating monsters, the icebergs. Breaking off from massive Greenland glaciers, these mountains of frozen water, frequently as long as a city block and standing half as high out of the surrounding ocean, are carried irresistibly along by the currents. Some of the northern bergs (for there are also bergs in the Antarctic regions) reach the Labrador current and are carried by it towards the heavily traveled North Atlantic steamship lanes. These bergs cannot be held back, destroyed by any means now available, or even diverted from their course. And so the iceberg still remains a menace that science, with all of its resources, cannot control, or even regulate.

Although icebergs have for centuries been the dread of all ships crossing the North Atlantic, their grim beauty nevertheless is so great that they never fail to arouse intense admiration and awe in the hearts of all who see them. No amount of study—and no amount of reminding yourself that after all they are nothing more than big pieces of land ice that have drifted out to sea—will subdue or even sensibly decrease the emotions that grip you when you view them from the comparative safety of a stout ship. The stoutest ship, also, is in danger from bergs.

When first sighted on a bright, sunny day, and if the visibility is good, you can spot a large berg as far as 18 miles away. Its appearance is somewhat disappointing. The berg will seem like nothing but a small spot of shining white. Even when your ship draws closer, you may still have a small feeling of having been cheated. Since there is no scale to judge the distance between yourself and the berg, the berg will always seem to be closer and therefore much smaller than it really is.

But, if your ship should steer quite close to the iceberg, then the true wonders of the sea monster will unfold themselves. You will see that the shadows are actually a faint heliotrope in color, instead of the grayish-white that they seemed to be. The cavities in the berg will now show up in fantastic azure blues and riotous peacock greens, which must be seen to be believed.

In form, the northern iceberg is usually pinnacled, with one or more sharply cut peaks rising up from the main mass of the berg. The lower levels of the part of the iceberg that you can see will usually be rounded by the action of waves, and also from the small streams of "thaw water" trickling down continuously from above. Even though close to a berg that seems to tower far overhead, and almost to fill



Aboard a floating weather station on the Coast Guard cutter *Duane*. Releasing a balloon to which a copper wire is attached for tracking by the ship's radar, thus revealing conditions of drift.

the entire horizon with its bulk, you are actually seeing something less than 15 percent of the entire mass. The remainder of it, of course, is *below* the surface of the water. Thus, comparing the largest battlewagon now afloat with a good sized iceberg is something like comparing an oyster shell with a stout wooden log.

Watching the waves breaking against the sides of an iceberg, you naturally expect the ice monster to rise on the waves, somewhat as a ship does. This, of course, the berg does *not* do, because of its gargantuan size. However, a change in the center of gravity *within* the iceberg, resulting from underwater erosion or a breaking off of a part of the berg, does impart a rolling motion to the mass.

The period or time of the complete roll, however, is so long that only by watching the berg carefully over quite a span of time can you make out this motion. If the berg has been washed away more on one side than on the other, as sometimes happens, then you may see an awe-inspiring sight, with the vast ice structure effortlessly tilting and slowly swinging through an arc of many degrees. On rare occasions people have actually witnessed the capsizing of an iceberg—surely one of the most wonderful yet fearful spectacles to be found in Nature. It is an occurrence that may actually endanger the watcher, too, because the underwater part of the iceberg may come up unexpectedly and strike and sink a ship whose skipper has not been as cautious as he should be.

Just what is an iceberg? It is a sizable piece of ice broken off from an ice sheet covering certain land areas in the far north or the far south, such a sheet having formed when the temperature is so low that

one season's layer of snow cannot melt before the next season's snowfall occurs. There are certain definite differences between the bergs formed in the Arctic and those of the Antarctic, even though both kinds are formed in the same manner.

In the north, as the ice sheet increases in thickness with succeeding snows, its edges begin to creep down to sea level. They are urged on by the weight of the accumulation of successive years of

snowfall. Greenland—with the exception of its coastal fringe—is covered with a high, thick ice cap that produces practically all of the bergs seen in the North Atlantic. There are some one hundred glaciers along the western coast of Greenland, yet most of the icebergs are produced by only twenty of them.

Bergs that are "calved" by the glaciers along the western Greenland coasts travel some 1800 miles in the two and a half or even three years that elapse before they arrive at the shipping lanes in the Grand Banks. Many of the bergs, of course, disintegrate before the journey is completed, but the comparatively small number of ice masses that do survive cause enough trouble as it is.

The ice of a Greenland iceberg is like all glacier ice—it is not clear, but is so full of bubbles that it appears to be shiny and white, almost like porcelain enamel. The berg is *not* smooth, however, being full of both large and small cracks and crevices caused by the continual expansion and contraction of the ice as sun or shadows fall upon it. The formation of these cracks is accompanied by sharp, snapping noises, for all the world like a series of rifle reports.

Large blocks of ice are frequently loosened from the parent berg by these alternate changes in tension. They break off and come thundering down the sides of the berg, roaring like small avalanches, which, of course, they really are. The smaller pieces formed in this way are known as "brash" ice. The larger sections of ice are picturesquely referred to as "growlers." In some ways, these growlers are more of a terror to shipping than are the parent bergs. Growlers are too small to be easily seen at night, or in foul weather, yet they are quite large enough to rip the hull of a

The warm current of the Gulf Stream has hastened the disintegration of this iceberg, making it a lovely but less dangerous mass.

ship with the greatest of ease.

Such is the appearance of the northern bergs in fair weather, when their size and their fantastic architecture make them things of majestic grandeur never to be forgotten. In squally weather, or on a dark night, however, the berg really becomes the terror of the northern seas. Then, if seen at all, the iceberg appears suddenly as a white and ghostly mass shrouded in the mist that it continually condenses around itself. It is dreaded by all who sail the seas, and has added many a white hair to officers of the watch, who must be alert in iceberg waters.

Moreover, as icebergs age they weather more rapidly above the water than they do below. In this way, they develop what is commonly called a "foot" of ice below the waterline. This "foot" is treacherous because it is difficult to detect, even in clear weather, yet it lies perilously close to the surface of the sea.

Although there had always been trouble in the North Atlantic for ships—and especially in that



happy hunting grounds of icebergs, the Grand Banks—nothing was done towards establishing any sort of system for guarding ships against the dangers from floating ice until 1912. But on April 14 of that year, when the steamer *Titanic* was sunk by the "foot" of a weathered berg, and with appalling suddenness and great loss of life, there rose a universal demand for a patrol in the ice zone to warn passing vessels of the day-to-day danger limits during the entire iceberg

season. This patrol was performed throughout the dangerous period of 1912 by two Navy scout cruisers. During the summer of 1913, the patrol was undertaken by the U. S. Treasury Department and was performed by the United States Coast Guard cutters *Seneca* and *Miami*.

Later, the International Conference on Safety of Life at Sea established a regular patrol. This international service is conducted by our Coast Guard, the expenses being apportioned among the various maritime powers most interested in Atlantic ships.



Something different in spring plowing as the Coast Guard cutter heads into the crust of a North Atlantic ice pack.

Various experiments have been conducted by the men of the Coast Guard in trying to hasten the disintegration of the more dangerous icebergs by blasting them or dropping high explosive shells on them. To date, however, little progress has been made, although many different kinds of explosives have been tried out. The main difficulty with blasting seems to be the impossibility of sinking the charges deep enough into the ice to have any effect upon the enormous under-water portions. While some success has rewarded the efforts to destroy the smaller but equally dangerous growlers with explosives, it has been found practically useless to bother with small bergs or growlers, since in a matter of a week or ten days they completely disintegrate.

All the other weapons in the arsenal of science are being used in the Ice Patrol, as well as explosives. Aviation, radar, and loran are now being employed to insure better detection. Radar, however, is *supplemental* and does not offer a complete substitute for the caution and watchfulness of lookouts on ships. So a vigilant patrol by cutters and aircraft is still essential. These planes and ships are based at Argentia, Newfoundland, where the International Ice Patrol Commander has his staff headquarters.

The Coast Guard commences its ice patrol whenever the presence of ice begins to threaten traffic in the North Atlantic, which occurs about March of each year. The Patrol covers an area about the size of Pennsylvania, and is in the general region of the Grand Banks of Newfoundland. During the larger part of the ice season—which usually extends from April through July—this region is usually blanketed by fog created by the confluence of the Gulf Stream and the Labrador current. And through this area pass ships of the world's heaviest sea-borne traffic.

Coast Guard-manned B-17's make aerial surveys of ice conditions, supplemented by additional Coast Guard aircraft when required. Information concerning ice, growlers, and icebergs is collected by the patrol vessels from the aerial surveys, and from sightings reported by ships and planes operating in or crossing the area subject to the ice hazard. Whenever it is practical, commercial ships are also requested to report by dispatch their position, course, and speed, together with a brief description of ice sighted, every four hours while in the ice area.

This information is summarized each day in radio dispatches broadcast to all shipping twice daily. Some idea of the importance that mariners in the vicinity of the Grand Banks place on the receipt of this ice information is indicated by the fact that practically all commercial radio transmission ceases during the periods when ice information broadcasts are being put on the air by the Ice Patrol commander!

New ideas, such as the use of loran, for checking the exact position of bergs and ice after they have been sighted and for combating the ice menace, are constantly being employed. Changes in routine of the patrol are being made, too, as a result of introducing wartime equipment into peacetime use.

In safeguarding the merchant shipping, the United States Coast Guard keeps abreast of the most recent scientific developments, and employs the newest equipment, *after* it has been checked and found satisfactory for ice patrol work. How well our Coast Guard has performed this arduous, little-heralded, and often dangerous work is evidenced by the fact that all of the other maritime nations have sailed these danger-ridden waters confidently and with absolute safety ever since the day that our Coast Guard took over the vital job of running the International Ice Patrol.



## Psychology Lecture

By DANIEL SMYTHE

We take each word as it arrives  
By parasympathetic means—  
A man's projections and his drives,  
The homeostasis and the genes.

He speculates upon the hope  
Of overwhelming Purkinje.  
He mentions instinct, coenotrope,  
And then brings in pugnacity.

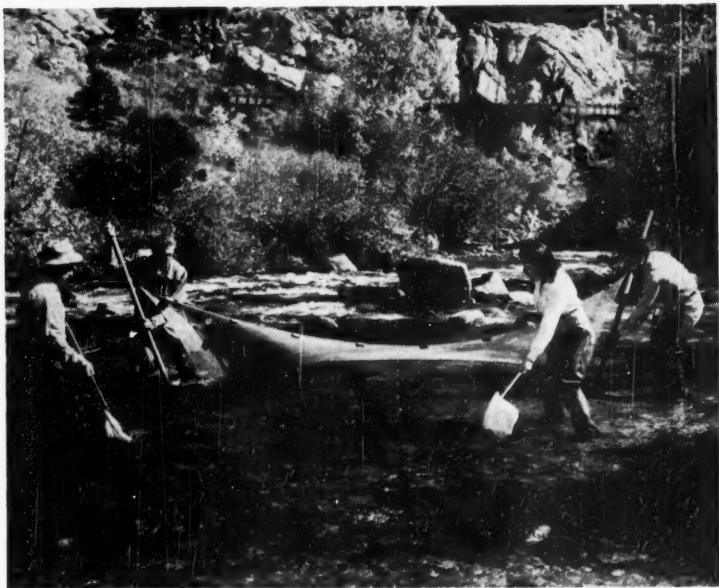
The mind may dream and rationalize,  
Finding each valence out of joint.  
Our compensations emphasize  
The James-Lange theory point by point.

And goals, incentives, motivate  
Reflexes on the separate nerve.  
The sphygmanometers wait  
For what emotion has to serve.

Regression works above, below;  
Neuroses guide us in our acts.  
Slim vectors tell us where to go . . .  
And, gentlemen, these words are facts!



With the help of a seine stretched across the middle of Boulder Creek in Colorado, R. W. Pennak and students of stream biology at the University of Colorado begin their research by "fishing" for specimens.



## Fishing Is Serious Business

By N. W. HARRIS

**W**HEN you are dealing with a million-dollar seasonal business, you like to be sure of the product you are selling. You want it to have appeal; to be superior in every way to all competition. Most important of all, you want to be sure it is always in stock.

This summer, approximately 172,000 anglers will come to Colorado to fish. Fishing is "big business" in Colorado; a backbone for the state's tourist income. A good supply of healthy, full-grown fish is, therefore, of primary importance to the economy of the state. And the natural condition of the lakes and streams is of vital importance to the fish.

Although Colorado waters are stocked each year with millions of young fish, only a part of the fishing demand can be met by this artificial method. The rest is up to Nature.

This division of responsibility has naturally brought up many questions as to how well Nature will pick up where stream planting leaves off. One of the most perplexing problems to Colorado game authorities and fishermen, alike, is the superiority of Western Slope streams over those on the eastern side of the state. It is almost as though the sharp ridge of the Continental Divide had split the state into good and mediocre areas for fishing.

Sportsmen comparing their poor luck on the Boulder or St. Vrain creeks with their catches on the Gun-

nison and the Frying Pan know there is definitely something "fishy." So do the men in the State Fish and Game Department who have compared statistics at the creel census stations all along these different creeks. And so do the experts on aquatic biology.

One of these men, now engaged in vital research on Colorado's streams, is Robert W. Pennak, an associate professor of biology at the University of Colorado in Boulder. Pennak first became interested in the problems of fish production and growth about thirteen years ago, while doing graduate work at the University of Wisconsin. Coming to Colorado in 1938, he found a new interest and many new problems in the mountain lakes and streams. His research work became such an important part of the activity of the University of Colorado Biology Department that a special course in stream biology was added to the curriculum.

"As far as we know," said Pennak, "it's the only course of its kind in the country. And it not only gives graduate students a chance to get out in the field and study Colorado stream problems first hand; it provides me with a great deal of new information."

Several days a week during the summer, the scientists are given a chance to combine mountain air with research and college credit. Equipped with boots, dip nets, and seines for their "fishing," they head out through the canyons to the streams west of Boulder. The region is rich in outdoor laboratories.

Driving through steep-walled canyons and mountain meadows, they look for places in the stream where it is most convenient to use their field equipment.

First, the flow of the stream is checked in a relatively simple way. A piece of wood is timed as it passes between the two markers of a 100-meter section of the stream. Then other factors are determined with the use of scientific apparatus and complex formulas. The type of stream bottom, temperature of the water, its acidity, hardness and the amount of pollution are all carefully checked, for each of these factors has been found to influence the number of fish that a stream can support.

For instance, it is well known that the amount of water obtained from melting snow and summer rainfall greatly affects reproduction and egg and fry survival.

Varying stream conditions can also affect the water's fertility and eventually, of course, its fish productivity. The University of Colorado biologists have found that the fertility of Colorado's streams, like the richness of its land, can range from the best to the worst.

As a matter of fact, the fundamental problems of fish culture and agriculture are very much the same.



**Robert Pennak, Colorado University biology professor, disturbs the life on the bottom of Boulder Creek in order to get samples of fish food organisms for research in aquatic biology.**

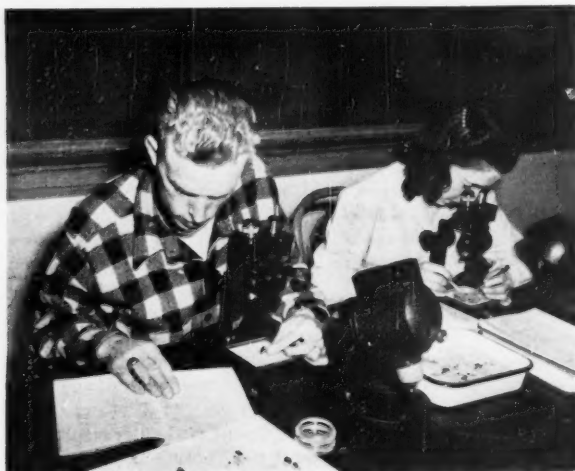
A fish, like man, must depend upon plant life as the original source of all food. Both microscopic and large aquatic plants, like soil plants, require certain quantities of essential minerals. When the earth is lacking in sufficient amounts of these elements, fertilizers are prescribed for the healthy growth of the plants. While these measures can also be applied to a certain extent to waters in lake regions, they are of no value to the swiftly moving streams of the mountain states.

If you are one of the 172,000 anglers that will cast a fly on Colorado waters this spring, your catch will be the end product of a life-chain more complex than you would imagine. And the size of the catch will tell you a story of hardships or relatively "easy living" underlying the turbulent waters of "fishdom." For each fish depends upon many conditions affecting fertility and plant growth. Microscopic organisms such as

diatoms, algae and protozoans are important to the young fishes produced by Nature, and are also important to the growth of such morsels as water fleas, snails, worms and insect larvae. Fry with which streams are stocked feed upon these last, so the microscopic plant and animal life is basic to the health of a stream. And if, at any point along this complex chain of events, a link should break, it would destroy the entire natural process of fish growth and reproduction.

In Colorado, this chain has been broken on some streams by pollution from mine tailings. In studying the fertility of streams exposed to such abuse, Pennak's biology students have found fish food production to be very low, chiefly because of the smothering effect on fish food organisms.

Colorado has had statutes against stream



**Back in the laboratory, these Colorado University biology students take a good look at the organisms brought in from the fishing areas.**

pollution for over fifty years. Expensive and lengthy litigation against mining companies has restrained the practice of discharging tailings into the streams, but a return of mining activity during the past few years has revealed the laxness of law enforcement.

The fact that many of Colorado's eastern slope streams are heavily polluted is in part an answer to the poor fishing thereabouts, but the entire blame cannot be laid against the mines alone.

In the course of their roving research, the University of Colorado scientists have also noticed other strange differences that line up with either the east or the west. For instance, they have discovered the high productivity of streams with rubble bottoms. The crazy-quilt design made by colored rocks on the bottom of Roaring Fork creek near Aspen is an example of this. The crevices between rocks of such size afford excellent shelter for insect larvae.

In sectional sampling of the stream bottoms, the scientists obtain a patch-work picture of how well a stream keeps house for its finned inhabitants. A stream of poor fertility may have less than fifty insect larvae per square foot, while a rich stream will abound with as many as four hundred. In addition to sampling for this fish food, the biology students are

particularly adept at "fishing" for specimens of game and forage fish with a seine.

This unorthodox activity is carried on, incidentally, with the complete permission of the State Fish and Game Department. From their catches, a few representative fish and fish food organisms are brought back to the laboratory on the University campus for identification and study.

The work of Pennak, and his students, in many ways dovetails with the research being done by conservation agencies and the Fish and Game Commission. But, in other places, it moves afield into related problems of conservation.

The University of Colorado scientists are unhurried and, consequently, thorough. This is the type of independent research that braces modern American business. There is a constant demand in any big business for a better product through progressive research. But much of this research must be done independently because of the urgency of continued production. The bigness of Colorado's fishing "business" has produced this same insistence. Fishermen, businessmen and scientists alike are anxious to get at the root of the problems peculiar to Colorado waters, and better knowledge of fish life is a prerequisite.



## The Locoweed of the West

By JOHN UNDERWOOD

THE white locoweed, *Oxytropis lamberti*, of the high plains and the foothills of the Rocky Mountains, is one of the most beautiful of the early summer flowers of that region. Among the sagebrush and over the greening hills, the clumps of loco gleam like patches of clean white snow. Individually, the blooms resemble many of the vetches, although larger and more perfectly formed than most of them. Occasionally lavender or purple, the loco is predominantly white.

Like certain other handsome wild flowers, notably the larkspur, the locoweed is, unfortunately, not only beautiful but a source of danger and sickness to livestock. A locoed horse, one that has acquired a taste for loco and become "addicted" to it, slowly sickens. Although the loco may not be fatal, the animal becomes worthless, physically and mentally. Cattle and sheep may suffer similarly.

For this reason, the locoweed, for all its beauty, is not a welcome sight on the ranges and in the pastures of the West. Its eradication is almost impossible. It spreads rapidly and can survive the bitterest winter



weather. In range country it remains always beautiful and frequently noxious—a Jekyll-Hyde plant.



The bird ran ahead a few feet at a time, then stopped dead in its tracks, looked and listened. The rest of the flock kept about a dozen paces behind him, strung out, one behind the other, three or four feet apart.

## Natural Wisdom

By PATRICK H. ASHBY, M.P.

*Illustrated by C. L. Ripper*

**W**HENEVER people talk about "wild animals," I think of ferocious beasts, roaring lions, snarling tigers—savage creatures that put the fear of the Lord into one's very soul. When people talk about "wild life," the impression I get is of something that is not controlled, something that is shy or timid, fearful of everything else that moves. I much prefer the words "free life" rather than "wild life," for, really, living things can be divided into the two classes, free life and slave life. The poultry in our poultry house are not free, but controlled. They are slaves, but the partridges now feeding on our lawn are free. The words "free life" will convey a much truer meaning to us all if they are used.

Free life appears to do everything naturally, which means easily and rightly. It is only when unnatural conditions are imposed upon living things, thereby interfering with natural laws, that living creatures become confused and act unnaturally. These thoughts, and many more, came to my mind when I looked out of my study window and saw an object, under the dark foliage of our spruce hedge, that looked like a clump of earth. Having had this scene before my eyes for many years, any little alteration or addition was immediately noticed. As I looked at it, the object moved. Then I saw more of these objects that moved, almost imperceptibly, towards the one I had first seen. Getting the field glasses, I focused them on the objects, which were revealed to be our little flock of English partridges. We call this flock "ours" because each

year these birds, with prairie chickens, pheasants and ruffed grouse, are raised on the farm and remain with us all summer, fall and winter. In the early spring this flock breaks up, the individual birds scatter far and wide to pair up with individuals from other flocks, and the cycle begins over again.

The natural wisdom of all free life is always a wonder to me. I have read that only human beings think and reason things out. I sometimes wonder if our "reasoning" is not unnatural. It is always difficult for living things to adjust their lives to unnatural conditions, to conform to unnatural regulations, mis-called "laws," for the only true "laws" are the laws of Nature. It is still more perplexing to think unnaturally. On the other hand it is simplicity itself to think naturally, for such thoughts automatically come to free life without effort.

Our little flock of English partridges exhibited this natural wisdom before my eyes. We know this flock of partridges, for we have watched them develop from the tiny chicks until they reached maturity. These birds can fly, it seems, before their wings are big enough to carry them. We scatter hulls of sifted, chopped grain, containing bits of cracked wheat, oats and barley, over a small area for these free birds, and they come at quite regular intervals to feed. This gives us an opportunity to see life, free life, during the long winter months, instead of a dead, white expanse of snow that seems changeless to those whose work—and the weather—confines them to the house.



To approach the feeding ground, this flock of English partridges used the rather long grass on the expansive lawn in front of the kitchen window, a view designed to give the busy housewife a picture that changes with the seasons, and presents many interesting and pleasurable diversions. In this approach the birds never flew directly to the feeding ground, but settled several hundred yards away, and, keeping more or less together, sporadically crossed the lawn with its adequate cover. This time, however, they did not cross the lawn, but selected an alternative route.

The reason was that the grass was covered with a blanket of snow that had fallen the night before. The birds were thus confronted with a situation never experienced before, yet they solved the problem easily and spontaneously. They did not feel it necessary to set up a committee to investigate the facts, or to argue endlessly about methods. They simply flew directly to the spruce hedge. I know it is easy for us to dismiss the matter from our minds by stating the birds instinctively used this method of approach in preference to several other methods available to them. The truth is that the birds knew, not from experience, for they had never seen snow before, that their dark bodies would be clearly visible against the white snow. The spruce hedge had kept the snow off the ground under the thick boughs of the trees, providing the birds with such a complete camouflage that, had I not been accustomed to seeing them and the details of the scene outside my study window, I would certainly never have noticed the dark object that turned out to be the leading bird.

I dropped my work temporarily to call my wife, and the two of us watched this bird and his flock. As we watched, I wondered how this particular bird became the leader, for leader he was, and a good one. I presume it was a cock bird, but it may have been the hen that raised the others. It may have been one of the original flock, or it may have joined it from outside. At any rate, he seemed to be in no particular hurry, like an old Indian I once traveled with in the far North many years ago, who once said to me, "Why hurry? We live." This bird ran ahead a few feet at a time, then stopped dead in its tracks, looked and listened. The rest of the flock kept about a dozen paces behind him, strung out, one behind the other, three or four feet apart. At last he came to the end of the hedge, which is about two hundred yards long, and there he waited until the whole flock had gathered about him, clustering under the protection of the last spruce tree.

Then the leader bravely ran out into the open a few feet, stood erect with neck stretched up to its full length, and, motionless, scanned the surroundings for fully a minute. Then it ran swiftly to a group of huge boulders, placed for decorative effect on the open lawn nearby. Again it stood perfectly still for a few moments, and, being assured all was safe, it

must have given some kind of signal, for the rest of the flock all ran out from their hiding place under the spruce tree with quite apparent delight and abandon, like a lot of happy school children just let out of school. They darted about here and there with the utmost confidence, sending up little white puffs behind them as they scratched away in the newly fallen, powdery snow, but soon joined their leader among the boulders. From this point to a huge glacial rock of a ton or two was but a few yards and soon reached. The next journey to the feeding ground was an open stretch of lawn of about twenty-five yards.

The leading bird ran out from all the others, its short, little legs moving as rapidly as one could flutter one's tongue, covering half the distance in a few fleeting moments, stopped momentarily, then completed the journey. There he stood alone as motionless as a stone. As long as he stood thus, so did the rest of the flock. We looked first at this bird, then at the flock. The moment the leader relaxed, the whole flock came right out into the open and covered the distance separating them quite haphazardly, fully confident in their leader, who had safely led them the long way around rather than the shorter, exposed route they had used for a month past. Not until all the others were busily feeding did the leader join in the feast. From then on there was a constant bobbing of heads. About every second of time one or more heads popped up to keep watch.

In my position as an elected representative of the people of Canada, I pondered over the simple lesson thus demonstrated before me. I do not know how this particular bird became the leader, but this I do know—that bird understood its position and knew he was responsible for the welfare of the flock. This certainly appeared to be his first duty as a leader. He knew, also, that he was responsible for his own actions and would suffer the consequences for any mistakes made, for he would be the first to be picked off by predatory animals or human hunters. Yet he was willing to sacrifice his own safety, actually risk his own life, to serve those who had placed their faith and trust in him. His reward? Apparently the satisfaction of knowing he had preserved the health and the freedom of his kind and enabled the flock to enjoy the fullness of life and living sought by all free life.

It seems to me that human beings are abandoning natural laws and substituting artificial, man-made rules and regulations that are forcing us to live artificial and unnatural lives, which results in all the evils that accompany everything that is artificial. It is difficult and confusing to us, as it is to all living things, to adjust our lives to unnatural conditions. As a result, the crimes committed by this creature known as *Homo sapiens* constitute a major problem. The solution, I feel sure, can be found by paying heed to the natural wisdom of such lowly creatures as a flock of English partridges, or to other creatures of Nature.



Lima Oneto of Nags Head, North Carolina, gathers yaupon from a bush in her front yard. This American holly with the spikeless leaves has long been used as a beverage by the "Outer Bankers." The holly is prepared by chopping twigs and leaves. The plant grows in great brakes and thrives in sand, developing rapidly. A panful of the chopped material is parched in the oven, although the natives of the banks formerly cured it with hot stones in barrels.

## Carolina Tea-Time

By DOLORES BUTTERFIELD JEFFORDS

*Photographs N. C. Dept. Conservation and Development*



**I**F YOU have regarded holly as useful only for Christmas wreaths, you have misjudged its versatility. Natives of the coast and "Outer Banks" of North Carolina have long enjoyed it when made into a refreshing tea, which of late years has rapidly been gaining favor with visitors from other parts of the country as well.

They use, to be sure, a special kind of holly, called yaupon, or cassena, the scientific name of which is *Ilex vomitoria*, as distinct from the common holly, *Ilex opaca*. The yaupon is a semi-tropical coastal plant, growing from Virginia to Florida and westward along the Gulf Coast to Texas, but seldom found at any great distance from salt water. Although it may occasionally attain the proportions of a tree, twenty-five feet in height, it is essentially a shrub, rarely exceeding a height of ten or fifteen feet. It is very decorative, with small, spikeless, glossy leaves. In April tiny scarlet flowers cluster along its branches, and in autumn or early winter it bears an abundance of the bright red berries characteristic of the holly. These berries, of course, are used locally for holiday decorations.

Yaupon tea is made from the leaves and twigs of the plant, which are cut up for the purpose. Years ago the procedure was to put the leaves in a barrel, placing hot stones on them, but modern usage calls for parching them in an oven. When the tea is brewed, a syrup is added, made of lemon and orange juice with cinnamon. The resulting drink is pleasantly

Mrs. Oneto, a charming hostess, pours yaupon tea for guests. On the mantel is some of the plant used as decoration. In the winter it bears berries of fiery red.

A yaupon tea party in the lobby of the Carolinian Hotel at Nags Head. The experiment was so successful that visitors are now taking yaupon home from their vacations, and the hotel has added it as an item on the menu.



tangy and stimulating, and has been likened to the South American *maté*, which is derived from a close kin of the yaupon, the *Ilex paraguayensis*.

Yaupon tea was known to the Indians before the arrival of white men in America. Núñez Cabeza de Vaca, one of the Spanish explorers, relates having seen the Indians making this tea, first toasting the leaves in a large pot over a fire, then filling the pot with water and letting it boil. They made quite a ceremony of it, drinking the tea as hot as possible, and in specified quantities, for a period of three days, during which they abstained from eating.

René de Laudonnière, one of the few survivors of the ill-fated French Huguenot settlement in Florida, also wrote, in 1564, of the Indian use of this tea, stating: "They drinke this cassine very hotte," and adding: "They make so great account of this drinke that no man may taste thereof in this assembly unlesse hee hath made proove of his valure in warre."

Somewhat later historians tell of the fabulous prices, in goods exchanged, paid by the inland Indians for yaupon.

The white settlers adopted this Indian beverage, and, in fact, thought so well of its medicinal value that they sent plants to England, where it was common in the gardens about London in 1700, among the

other medicinal herbs which it was the practice of the time to raise in private gardens. While beneficial in moderation, the infusion cannot be partaken of recklessly, since it has laxative and emetic properties.

But nowhere has the use of yaupon tea survived as persistently as in coastal North Carolina. Not only have the natives preserved the habit from Colonial times, but it has become increasingly popular with vacationists at Nags Head resorts, and has even achieved the social distinction of being included in the menus of the principal hotel. Which is as it should be, since the sand dunes of the area provide one of the yaupon's most flourishing habitats, and it grows wild in profusion there, in dense "brakes" and thickets.

But the natives of the region like to have it growing in their yards, where its bright flowers and berries add a colorful touch in season to their gardens, and the main ingredient for a pot of their favorite tea is always at hand. Yaupon is thus multiple-purposed.



## For This I Ask

By HARRY ELMORE HURD

May earth—the good dirt of the earth—be mine  
To praise forever in my lilting song  
And all that roots therein—the lordly pine,  
The lowly fieldweed, make my fibre strong.

May music of bird and insect find my heart:  
Even may the raucous-throated jay  
Color the textured pattern of my art  
And add new rapture to a winter day.

May I do honor to the earth I wear,  
Not gracefully nor for too long . . . too long . . .  
Be swift, for snow already whites my hair:  
There are too few days left for joyous song.

# A Peat Bog Log

Another article in the new series  
of educational features

By E. LAURENCE PALMER

Illustrated with drawings by  
Stephen Collins



**T**HERE are too many words in the English language that have more than one meaning. To a city man, a bank is something quite different from what it is to a country-bred person. And so the title of our article this time can easily have more than one meaning. To many, a log is a portion of a woody plant, while to others it may be an account of a series of happenings. It is to this latter interpretation that we now yield. What is the story of a bog; what are bogs; how do they get the way they are, and what good are they?

To many persons, bogs, marshes, swamps, mires, sloughs, quagmires and quicksands are more or less the same thing. This is a slipshod way to look at an interesting phase of Nature. All these kinds of areas have water, to be sure, and they all may have plants and animals. But the water, plants and animals in bogs are different from those in the other places mentioned. There are good reasons why they are different, and because they are different they may be expected to yield different things. In the first place, while marshes, swamps, mires, sloughs and quicksands have water, as do bogs, the water in the non-bog group is usually constantly changing through drainage of a sort. The water may be lime-loaded, or salty, in these other places, but not in a true peat bog. And the chances are that were we to try to select nine characteristic plants for each of these types of watery areas our task would be

easier with the peat bog than with any of the others. So, in some sense, it should be easier to understand a peat bog than to understand the other types of wet places with which the bog might be confused.

In a way, a peat bog is a little world in itself. A swamp or marsh may take tribute from the great valley that produces the waterway it may border. But a peat bog is usually to be found in a small, or a relatively small, area. It usually represents the accumulated drainage of a small watershed of such a size that the rainfall is more or less matched by the local loss through evaporation. There must be a reasonably abundant and sustained rainfall during a relatively long summer growing season. Our peat bog begins, then, with a depression in the surface of the earth into which Nature will be pouring water just about as rapidly as it is evaporated.

Naturally, this little valley world, with its water and sun, may, in the earlier stages, support plant life. But when these plants die, their wastes, in part in the form of humic acid, have no place to go except to the bottom of the depression. There they will continue to accumulate, instead of being dissipated as they would in an open, well-drained valley. Since they become more and more concentrated, it should be obvious that it will be increasingly difficult for the organisms that normally cause decay to function. The reason for this, of course, would be that the waste products of decay



COTTON GRASS



WILD  
CRANBERRY



DRAGON'S  
MOUTH



LEATHERLEAF



would continue to accumulate, and no organism can live in an accumulation of its own waste product indefinitely.

We started with a bowl-like depression that Nature kept more or less uniformly supplied with water. Then, we had plants growing in this bowl. Then, these plants died and the products of their decay accumulated and continued to accumulate. The result was that the only kind of plants that could survive would be those that, among other things, needed little lime and could survive a high acid concentration. Eventually, these plants and their remains form a considerable accumulation. This may be so great that the new plants may be cut off entirely from contact with the underlying rocky material that formed the original surface of our bowl. These accumulations at first were greatest near where there was an abundance of water and some stability provided by the soil. But eventually these plants may become so crowded that they push out in a floating mat on the surface of the water. Given time, this mat may close over the water in the center of our bowl, covering the surface completely and still, possibly, leaving free water beneath. Naturally, such a mass of plant material, with no solid earthy support beneath, will yield readily to shifting weights. And so, as we walk across such a place, we find the surface on which we walk rising and falling, somewhat, with each step, and, possibly, the whole area around us shaking with our movements. The bog makes bog-trotters of us.

A considerable majority of the plants that we find growing in such a situation are either mosses like the sphagnum mosses, or members of the heath family. The mosses may, in some bogs, form the great proportion of the vegetation, but usually they are rather well reinforced by the woody parts of the heaths.

In the peat bogs that I have known for the most of my life, one of the most abundant plants is leatherleaf or cassandra, *Chamaedaphne*. The borders of these peat bogs are frequently marked by areas in which we find bog rosemary, *Andromeda*, and Labrador tea, *Ledum*, growing in abundance. These are usually taller than the plants near the center of a typical peat bog and are backed by the larger plants of the blueberry. Still farther away from the center of the bog, there may appear the ordinary substantial woody plants of greater size.

From the border of Labrador tea or bog rosemary to the center of our bog will usually be a low, level spot composed largely of the sphagnum mosses. Growing here and there in

this area will be some conspicuous cotton grass, *Eriophorum*, and, possibly, a few pitcher plants, *Sarracenia*. There may be a sprinkling of low leatherleaf in such an area but usually it is less crowded than nearer the shore margins.

The pitcher plant is always interesting because of the leaves, which are shaped like pitchers in which can usually be found a considerable amount of water. The throats of these pitchers are provided with a mat of hairs that point downward into the pitcher and, according to some interpretations, these hairs prevent unwary insects from escaping once they have entered the pitcher plant leaf. We are told in much literature that this is a device "designed to" trap insects, but this is hard to accept for many reasons. In the first place, it is not uncommon to find many of the leaves containing the larvae of some insects like mosquitoes, and these larvae are living apparently active lives. True, there will be the partly decomposed remains of many insects mixed in this water, but this might be equally true of any other container.

Mixed with the sphagnum near the center of our peat bog may be long, trailing, fine vines that bear wild cranberries. There may also be some buck beans, *Menyanthes*, some orchids like *Arethusa* or *Calopogon*, and, possibly hidden well among the other plants, some sundews, *Drosera*. These sundews are most interesting because of their gland-crowded leaves on which the gland-bearing hairs will enclose a quantity of meat or insect material. These leaves possibly represent the highest concentration of vitamin C in known plant tissue. To say that they serve as intelligent traps to capture otherwise lacking nitrogenous foods would undoubtedly be stretching the imagination unduly.

Given time, our peat bog may continue to add new plant material by the accumulation of new growth on the upper surface. As time goes on, the level of the bog becomes increasingly firm and may possibly be covered by silts and eroded material from the surrounding slopes. In such cases, it may be a snare and delusion in which an apparently firm, hard crust covers a definitely unconsolidated lower area. Over such areas roads may be constructed that are able to withstand normal traffic but unable to support heavier vehicles. Left to its own development, without being covered over, the peat bog would, theoretically at least, eventually become completely filled with undecayed plant material. Properly managed, this might serve as a tremendous reservoir of food for some plants.



SPHAGNUM



SUN DEW



BOG ROSEMARY



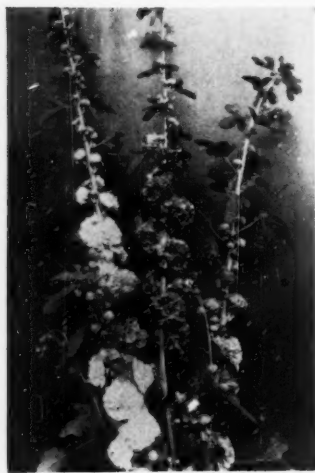
PITCHER PLANT



LABRADOR TEA

COMMON NAME	SPHAGNUM MOSS	COTTON-GRASS	PITCHER PLANT	SUNDEW
SCIENTIFIC NAME	<i>Sphagnum</i> sp.	<i>Eriophorum</i> sp.	<i>Sarracenia purpurea</i>	<i>Drosera rotundifolia</i>
DESCRIPTION	While these mosses were considered in an earlier unit of this series they must be here reconsidered because sphagnum mosses are probably the most characteristic of all peat-bog plants. The stems of sphagnum are usually weak with the branches covered with many loose plant cells capable of holding water.	To 4 feet tall with rather stiff, erect, stem-like portion usually round in cross-section below, and somewhat triangular in cross-section above, smooth and rather leafy. Leaves are narrow, flat, with the uppermost leaf-like parts to 6 inches long and to 1/5-inch wide. Leaf bases not wrapped around stem as they are in true grasses.	Consists chiefly of crowded rosettes of leaves, each leaf being pitcher-like with an open top, the inner lining at the top being covered with inward pointing hairs. The "body" of the "pitcher" is green, or frequently with reddish veins or with greener or purplish veins. Leaves are to 1 foot long and inflated.	Essentially a rosette of leaves that lies close to the ground, each leaf being long petioled and terminated by a more or less round blade, the upper surface of which is well supplied with sticky-tipped structures, the ends of which may bend towards the blade center when properly stimulated.
RANGE AND RELATIONSHIP	Sphagnum mosses are found in both hemispheres and are at their best in acid situations. There are some 30 species to be found in North America, one group having characters that are usually relatively easily recognized, including slenderness of stems, character of covering cells, color and other characters.	A sedge that is found in bogs from Newfoundland to Florida and west to Nebraska and Manitoba is <i>E. virginicum</i> , and with range extended to most of temperate North America and into the Old World if we include the other species. There are some 15 species to be found in North America the differences not always being conspicuous.	Found from Labrador to Florida and west to Kentucky and the Canadian Rockies in peat bogs and other acid formations. To the south of this range is found the related <i>Sarracenia flava</i> that reaches south to Louisiana. It appears superficially to be less robust than the above. There are 8 North American species.	Found from Newfoundland to Florida and west to Alaska and California, being in mountainous areas in California, and to elevation of 2500 feet in New York. Does best in wet peat bogs where there is high acidity, or on logs or wet sand where proper conditions prevail. Also found in Europe and Asia.
REPRODUCTION	Reproduction is by means of eggs and sperms that are borne by the stage of the plant that is most conspicuous. From the fertilized egg arises a stalked or similar capsule that produces spores that are spread by the wind only to produce male or female plants in some species, or plants bearing both sexes in others.	Flowers appear from June through September. Flowering part appears as a cottony tuft at the top of the plant; in this species the cluster appearing to be broader than high. Some species show a whitish "cotton," while others have this in different shades from white to brown, the brown being light or dark.	Flowers are borne at the end of stalks that reach a height of 2 feet and are nodding tipped. Flowers are yellow, greenish or deep purple, to 2 inches across, or even larger, with the petals curving over the tips of the pistils. There are many seeds in the 5-celled fruit that matures in late summer.	Flowers borne on a sparingly branched structure that rises to height of 10 inches, each flower being to 1/6-inch long and borne on separate stalks of about the same length, there being to 25 flowers on a flowering stalk. Flowers open in bright light showing red to white petals that are longer than sepals.
ECOLOGY	The great role of these plants possibly lies in their ability to take up moisture from the air and hold it against times when water is not otherwise available. This water, of course, can be used by the sphagnum, or possibly by plants growing among the sphagnum stems and may be more suitable than the "sour" water below.	Plants do not appear closely crowded as do most of the related sedges and a bog may be spotted with only a relatively few plants. The flowers bear both pistils and stamens, the numbers of stamens in the different species varying from 1 to 3. The fruits are obviously suited to being distributed by the wind.	Those inclined to read a purpose into unusual parts of plants readily suggest that the pitcher-shaped leaves are designed to hold a fluid that "digests" the bodies of captured animals, but these observers overlook the fact that some insects develop through their early stages within this so-called "digestive" fluid.	A so-called carnivorous plant whose meat-eating abilities are being questioned by research workers. Supposedly the leaves can capture insects with their sticky glands and "eat" them as food to get certain elements not commonly available where the plants grow. Plants are sometimes found closely crowded.
ECONOMY	Sphagnums are great bog builders. It is estimated that bogs largely sphagnum may build a 1-foot deposit in 10 years. Probably 1 foot of coal represents the accumulation of some 300 years of plant growth. It probably takes approximately 20 feet of raw peat to produce 1 foot of bituminous coal.	Plants are here considered only because they add a characteristic touch to so many peat bogs, and people visiting bogs where the plants grow invariably wish to know what the plant is. It should be remembered that, while the common name is cotton grass, the plant is really a sedge belonging to an entirely different family.	Any plant so unusual in form and habitat is interesting to the average naturalist. This plant and its relatives are no exception, and few plants have been better able to capture the attention of lurid reporters of natural phenomena. Reported medicinal properties probably do not exist. Has conspicuous galls.	That the plant is reasonably well known is testified by its many common names, including red rot, alluding possibly to red cast given to logs on which it grows, lustwort probably because of its purported lust for animal food, and dew plant because of the dew-like drops usually present on glands of the leaf.

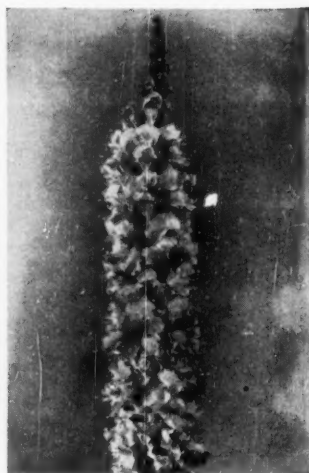
LABRADOR TEA <i>Ledum groenlandicum</i>	BOG ROSEMARY <i>Andromeda polifolia</i>	CASSANDRA OR LEATHERLEAF <i>Chamaedaphne calyculata</i>	WILD CRANBERRY <i>Vaccinium oxycoccos</i>	DRAGON'S MOUTH, ARETHUSA <i>Arethusa bulbosa</i>
May reach a height of to 4 feet as a shrub. Twigs are coarse, rather sparsely branched, furry, somewhat stiff and bear the alternate leaves that are to 2 inches long and to 2/3-inch wide. Leaves are dark green above with margins curving inward towards the lower surface that is covered with a dense dark wool.	A 3-foot shrub that is not profusely branched with rather slender stems that bear the alternate sharp-tipped, narrow based, incurved margined, sour leaves, whose under surfaces are almost white, and whose upper surfaces are a rich dark green. Leaves evergreen, to 2 1/2 inches long, and 1 1/3-inch wide.	Greatly branched shrub with fine twigs and branches that are tough, reaching a height of about 4 feet. Leaves are to 1 1/2-inch long, conspicuously covered with fine scales that rub off easily and may glisten when young. Leaves are evergreen, alternate and smaller in the upper parts of the plant.	A slender, sprawling, tough, woody vine that is to 1 1/2-feet long and may be well branched. Leaves are slender, fine, alternate, evergreen, entire, dark above and light beneath to 3/4-inch long and under 1/2-inch wide with incurved margins. Root system extensive and rather well branched.	An erect, low plant to 10 inches high; smooth and bears from one to three rather loose sheathing bracts and a single very slender leaf. The single flower is borne at the top and the plant arises from a small buried bulb. Except when in flower the plant is easily overlooked.
Found in peat bogs, or, more rarely, in sour swamps from Greenland to British Columbia and south to Pennsylvania and Washington. There is a related species to be found in North America, Europe and Asia in which the leaves are much narrower than in this species. There are 5 species in the genus.	Found in North America, Asia and Europe, mostly in the northern parts with a few closely related species, of which 3 are native of the United States. This species is found from Newfoundland to Alaska and south through British Columbia, Michigan and New Jersey.	May appear in almost pure stands at the edges of peat bogs, or over other acid soils, being found in the northern parts of the Northern Hemisphere around the world in suitable localities. In North America it ranges south to Georgia. It always favors exposure to the sun. There is 1 North American species.	Found growing native in both Northern Hemispheres, being found in North America from Newfoundland to Alaska and south to North Carolina and Washington. The fruits of this species different from those of the American cranberry in that these are spherical rather than oblong.	Found in bogs, mossy hollows and wet depressions from Newfoundland to South Carolina and west to Ontario, Minnesota and Indiana. On a world-wide basis there are but two species in the genus, ours being the typical one and the other being found in Japan.
Flowers borne in rather open clusters at the ends of the twigs, each on a stem of its own to an inch long. Corolla is to nearly 1/2-inch broad, with 5 petals and 10 stamens whose filaments are hairy. Fruit is a nodding, brown, globular, dry capsule that ripens in late summer and is to 1/3-inch through.	Flowers appear in May and June in relatively few-flowered clusters near end of branches on individual stems to 1/2-inch long. Corolla is about 1/4-inch in diameter, pink or white, constricted at free end, bearing 10 stamens. Calyx may be pale red. Fruit is a small capsule to 1/6-inch diameter, as wide as long.	Flowers are bell-shaped with the corolla about 1/4-inch long with the base somewhat larger than the free end and the end of the pistil protruding. Fruit is about twice the length of the egg-shaped seeds or shorter. Corolla has stamens attached and shows notches corresponding to the petal tips. Flowers April-June.	Flowers appear in May through July as nodding, pinkish bells borne on the terminal shoots, with corollas to 1/3-inch across and with parts dividing near the base. The filaments of the stamens are about half as long as the anthers. Fruits are red, tart "berries" about 1/2-inch in diameter and occasionally spotted.	The single showy flower appears at the highest point on the plant, is rose-purple, to 2 inches high with petals like the sepals but with a lip over which the other conspicuous flower parts seem to arch. Lip bears purplish blotches and 3 hairy ridges, is fringe margined and toothed.
A good plant to be accepted as an index of sour soil ordinarily, although it does not commonly grow with plants not having similar qualities. Plant physiologists suggest the woolly leaf covering as reducing loss of water or possibly of holding atmospheric water for use by the plant.	At best in sunny exposures in peat bogs usually near the edge of relatively solid ground, serving with spreading rootstocks to bind loose bog parts together. Relatively free from injury by fungi or by insects. Leaves contain the poison andromedotoxin in dangerous proportions if they are eaten by stock.	May be propagated by division, or by growing seeds in sphagnum and sand under glass in winter, and then transplanting the seedlings in spring. Plant serves excellently as a binder for loose sphagnum of a bog surface. Reported to contain the poison andromedotoxin but is used as a tea substitute.	Fruits are at their best in August and September, but may be gathered on through the winter. Fruits usually require much sugar, but they have a flavor that is welcomed by most even though the volume of the sugar needed may match the volume of the fruit being prepared.	Plant blooms in May and June and the flowers are followed by the inch-long, ridged, egg-shaped fruit that is a capsule. The plant is too beautiful for its own good and usually vanishes from a bog that is accessible to many visitors whether they are professional collectors or not.
Known to explorers as muskeg tea since the leaves were used as a tea substitute. Since it is known to be poisonous to sheep it is not recommended that it be used as tea substitute except in the greatest of emergencies. In spite of this it appears frequently in the lists of plants used by quack doctors.	Fruits may be eaten by game birds, and leaves have been eaten by stock, although in spring this is really dangerous. Interesting in that wax-covered leaves with incurved margins prevent much water loss and may enable plant to survive where the available water is physiologically useless or difficult to use.	Plants browsed freely by cottontails, and fruits form a staple food for sharp-tailed grouse in certain regions. Where soil conditions are right it may be a satisfactory ornamental but this not likely to be a common case.	The related cranberry of the market provides a substantial market because of its use in jellies, jams and in drinks and is almost a "must" for a side dish at Thanksgiving time. Common names for cranberry include moss melon, moorberry, crowberry and sour berry, of which the last is possibly the best.	There is little economic but much emotional value to this plant, and it requires a good teacher to make a class leave the flowers where they can appear at their best—in the native bog rather than in a big herbarium. This is a plant you see listed in floras more commonly than you see in life.



Indian Summer is the name of this hollyhock, winner of a bronze medal in the All-America trials for 1949.



Burpee's new Multiflora petunia, an All-America Silver Medal winner for 1949. It is a rich salmon color when mature.



A new double snapdragon named Lemonade comes from Burpee. Its flowers are large and a clear primrose-yellow.

## New Stars Flash on the Garden Screen

By ANDREW S. WING

**W**HAT is new in the garden? Many interesting items, and there is still time to pore over the catalogs. Since food is still a necessary and expensive item in the budget, let us look at the vegetables first.

High on the list is a bean called Triumph, which received a silver medal in the All-America trials. It is rated as a heavier producer than Henderson, with fat, green beans. It stands hot weather beautifully, and it is fine for canning or for freezing, drying well for winter keeping. It was developed by Dr. Robert E. Wester of the Bureau of Plant Industry in Washington.

Ideal Snowball cauliflower comes next. This received an honorable mention in the All-America trials. It came from Switzerland, and is said to be easy to grow, makes beautiful heads, called "curds" in the trade, which stand up well for a long time. The large leaves wrap over the heads, bleaching them and protecting them from the weather. Cauliflower is not quite as easy to grow as broccoli and Brussels sprouts, but I grow it every year in my garden and it heads up well, although the heads usually are not as large as those you get in the market. Since it is a cool weather crop, I start mine in the open ground and transplant it to permanent rows, where it will head up usually in September.

There are a number of new hybrid sweet corns. One of them that sounds especially interesting for the small garden is named Priscilla. It was developed by

the Connecticut Experiment Station, where so many fine hybrid sweet corns have been produced, and it is introduced by Goldfarb. This is an early variety that produces yellow corn, six to seven inches long, sweet and of fine quality. It matures in about seventy days. The stalks are only four feet tall.

Another outstanding hybrid corn is called Flagship. This is being introduced by several seedsmen, and it got an honorable mention in the All-America trials. It produces large ears of twelve to sixteen rows of golden corn. A strong grower, the ears are high up and it is able to withstand bad weather, such as cold, wet springs and hot, dry summers. It is also somewhat resistant to earworms. The flavor is delicious and sweet, and it is fine for either home consumption or canning. Other good sweet corns that are not new, but that are worth trying out, are Iona, Lincoln and Marcross. I personally like an older variety called The Burpee well, for it has large ears, matures in 76 days and is a good producer. It is similar to Burpee's Golden Bantam but larger and earlier. Another good early corn is North Star, offered by Harris.

In the field of lettuce there are several new things that are important. One variety from Peter Henderson, called Progress, comes from the U. S. Department of Agriculture and the New Jersey Agricultural Experiment Station. It is a heading variety, crisp, solid and of good size, with a rich, dark green color, slow to bolt. Other new varieties of lettuce, with All-America bronze medals, are Premier Great Lakes and Penn-



lake, both originated by Professor M. T. Lewis of Penn State College. Premier Great Lakes came from a selection of the important Great Lakes variety. The heads are better looking, more solid, larger and more uniform than the parent strain, and it is ready a week earlier than Great Lakes. The other bronze medal winner is Pennlake, which is smaller, but has a solid, attractive head. It is rated as a very good family lettuce.

A new radish sounds good to me. It is well-named Cherry Belle, and is a crisp, tasty introduction from Holland. Early maturing, and bright red in color, it has an even form and the tops are short. It is good for forcing as well as for general use in spring, summer and fall.

Now comes the gold medal winner—a summer squash named Spanish Caserta. This was developed by Dr. Lawrence C. Curtis of the University of Connecticut. It is of the Italian Cocozelle type, which means long fruits and a bushy plant. It bears a week earlier than Cocozelle and is prolific. The color is light yellow, striped green, and the flavor is outstanding. This is the first gold medal winner, by the way, since 1935.

In the tomato section, there is a promising new one named Wisconsin 55, introduced by Peter Henderson. It is an early variety, has a long season and is especially recommended for garden use. The fruits are large, rich and scarlet. The growth is luxuriant, and it is tolerant to early blight. Although not quite as early as the earliest varieties, it has a longer season and will therefore bear more prolifically.

Last, but not least, of the vegetables is a new watermelon, which is well named Icebox Earlybird and was introduced by Goldfarb. This is one of those diminutive affairs that easily goes into your icebox. The fruit is round, eight to ten inches long and weighs five to ten pounds. The flesh is red and sweet and the seeds are small. It is quite prolific, too.

Before leaving the vegetables, I would like to suggest that some of the older although not generally known items be given a try. For instance, how many American gardeners know snow peas? These aristocrats of the pea family are so sweet and so tender that you eat them pods and all. The peas are small,

the pods are large but flat, and you will enjoy their delicate flavor, even when eaten raw. Our catalogs call them edible-podded or sugar peas, but they are snow peas to the Chinese, with whom they have been considered a delicacy for hundreds of years. They also are popular in France, and why the idea never caught on here I cannot understand, because they are, to my taste, infinitely better than snap beans. They are easy

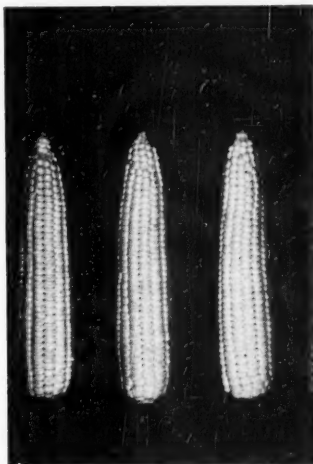
to grow, too, but since most varieties grow tall, they must be supported. I might add that the birds love them, also.

Another old standby that I always grow, but which too few people know, is the Winter Keeper beet. This grows so large that a single beet will make a meal. They are splendid to store for winter, but are sweet and tender at any stage, large or small. The tops grow large, too, and make fine greens.

If you like radishes, try one of the winter varieties, such as Black Spanish. They grow to enormous size and will keep through part of the winter, being protected by a tough, thick skin. The flesh is white, tender and the flavor is good. They should be sliced, moistened, salted and put in the refrigerator for a while to make them crisp before serving. You will find this an excellent way to serve turnips, too, if you like them raw, and they are much milder than radishes.

Leeks are another vegetable that should be more widely grown in the garden. They are as easy to grow from seed as onions, but require a longer season, and should be thinned out to about six inches for best development. They are fine used, tops and all, for potato soup, and, in fact, can be used in place of onions in almost any dish requiring an onion flavor, except that they are milder.

In the flower department, we have a great many stars to choose from. Starting with the annuals, we have three new snapdragons to recommend: Lemonade and Giant Skyscraper from the W. Atlee Burpee Company, and Giant Ruffled Tetra Orchid from Vaughan's. Lemonade is a double variety with large, clear, primrose-yellow florets. The spikes are strong and free-blooming. Giant Skyscraper is the tallest of all snapdragons, the central spike being three feet or more tall, colors ranging from sulphur yellow to primrose



**Flagship is a new hybrid, winner of honorable mention, a strong grower and able to stand a variety of weather.**



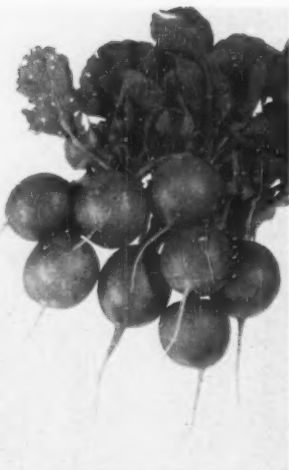
**Ideal Snowball is a cauliflower hailing from Switzerland and a winner of honorable mention in the All-America trials.**

yellow, canary, golden-yellow, apple-blossom pink, light rose, mid-rose and other shades. Giant Ruffled Tetra Orchid is a rich shade of orchid-purple, with sulphur-yellow blotch on the lower lip, a most unusual flower that is good for beds or borders and also for cut flowers.

There are several new asters, of which Heavenly Blue, by Burpee, and Princess Linda, by Vaughan's, are outstanding. The former has four-inch flowers and the latter is of the Princess type, the color being a clear rose.

Indian Summer hollyhock, offered by many seedsmen, is a bronze medal winner in the All-America trials for 1949. While actually a perennial, it flowers from seeds sown in early spring. flowers are double with a wide range of colors, including yellows and white along with pastel shades. Bluestar morning glory is a new introduction that received honorable mention in the All-America competition. It is a sport of the lovely old Heavenly Blue and is said to be better. It is a bright blue with deeper mid-ribbed stripes to form a star, which is very pleasing and attractive. Another interesting variation in the morning glory family is a dwarf named Blue Mound, introduced by Vaughan's. Instead of forming a vine, it makes a twelve-inch bush that is covered with flowers that are identical with Heavenly Blue. Silver Medal winner petunia from Burpee is one of a new hybrid class called Multiflora. It is a deep salmon pink, is early and vigorous, plants are covered with large single flowers until frost. A strong grower, the plant is self-supporting and prolific.

Among the perennials, there are quite a number of new varieties to choose from, some of them most interesting. Anchusa Caespitosa Blue Stars from Jackson & Perkins is one. Rigid stems grow fifteen to eighteen inches tall, forming mounds of clear blue flowers with white eyes. They bloom in June and July and have long, narrow, green foliage and prefer a light soil. Two new perennial asters from Wayside Gardens, originated in Oregon, are attractive. Pacific Horizon is a low-growing variety with delicate blue flowers. It is early and lasts for a long time. Aster



**Cherry Belle radish is a tasty introduction from Holland, good for forcing and all season and an All-America winner.**

Purple Feather grows about fifteen inches tall and commences to flower in late August; the flowers are purplish-violet and the plants give a feathery effect. Also offered by Wayside Gardens are Evangeline, a new border pink, gaillardia General George Patton, and a hardy geranium named Subcaulescens Splendens. It is a low-growing plant that is covered with small round flowers of an intense and brilliant tyrian rose. It blooms through the entire spring and early summer, is good for rock gardens or foreground of borders, and is about five to six inches high.

Before leaving the flower section, I would urge everyone to take a look at the new zinnias, new marigolds, and do not forget that there are also many wonderful new things among the lilies, gladiolas, irises, chrysanthemums and dah-

lias. Only a perusal of the catalogs will bring you the news of these choice offerings. Goldilocks, introduced by Jackson & Perkins, has won the John Cook Gold Medal of the American Rose Society. It is the first true golden-yellow floribunda rose and was originated in the research station of Jackson & Perkins at Newark, N. Y., by Eugene S. Boerner. A number of other fine roses are being introduced this season. Jackson & Perkins are also introducing a new delphinium named Happiness. This is a vigorous, hardy plant that bears enormous three-inch flowers, the inner petals of each floret being a lovely, soft, shimmering pink lavender with a clear blue on the outer petals showing at the tip edge.

This just about concludes the list of vegetables and flowers. There are, of course, many, many other choice and desirable things, both old and new, but to catalog them all here would not make interesting reading.

In the field of garden gadgets, equipment, insecticides and weed killers, there is plenty that is new also, but you had better consult the catalogs or go to your garden supply man for information about these things. Also consult the bulletins put out by your State Agricultural College, or, better still, see your county agricultural agent if you have one in your town.

## Question and Answer

By RUTH SEYMOUR VESELY

What little bird will calmly hop around  
Eating the sunflower seeds upon the ground  
While jealous blackbirds make a grating sound  
Like Winchell? . . . . . The finch'll.

# As We See It

An Editorial

## Wildlife Conference

ANNUALLY, conservationists are indebted to the Wildlife Management Institute for calling and financing the North American Wildlife Conference. This meeting has become the most important of each year's conservation gatherings, in many ways, and the Fourteenth North American Wildlife Conference held in Washington, D. C., in early March was no exception. Indeed, it was the most largely attended of all held to date.

In fact, these sessions have come to be almost misnamed a "wildlife conference" since, in the span of years since the first such gathering in 1936, they have become increasingly concerned with all phases of conservation. Soil, water, forests—even a dash of preservation—are given equal weight with wildlife in recognition of the interrelation of them all.

Each year the Conference brings together many people working in the field of wildlife management, administrators of State agencies and their staffs, Federal men from various bureaus concerned with conservation, representatives of public organizations and interested individuals. There are many young men, eager and alert. Altogether it is a stimulating gathering—stimulating, perhaps, because many of the subjects of discussion are still somewhat controversial, or, at least, a matter of differing opinions.

Perhaps one of the strengths of this Conference—and one of the reasons for its value—lies in the fact that the Institute travels under no false banner. It is an organization supported mainly by far-seeing people—sportsmen and industrial organizations—who recognize that the future of our wildlife and other renewable resources depends upon the wise administration of these resources, and upon the most exact knowledge of how to maintain them. In other words the viewpoint is that the only way to have one's natural resource "cake" is to eat it without gorging, and to learn how to bake it with the greatest culinary adroitness.

With one exception we have attended all of these sessions, and, as the years have passed, have come away increasingly encouraged. It is only fair to state that we have gone with a primary interest in wildlife for wildlife itself, and with a concern for conservation of our natural resources arising from a viewpoint more heavily protectionist than many of those present. And we have seen this view increase in force as

the exploiters, particularly of our wildlife, have waned in influence.

This is in large measure due to the increase in the appreciation of the scientific approach. The change has come about during the period in which the soil conservation program of the country has had a chance to show what it can do. In the same period most of the States have tremendously enlarged their research staffs and their educational activities. The forester has broadened his viewpoint to take in more than just the commercial and technical aspects of the standing timber, and, in the past decade and a half, the country has slowly become aroused to the menace of water pollution. So, when conservationists gather, they talk in terms of all these factors.

Most of the wildlife discussions, technical and general, are, of course, directed toward solving problems of providing more wildlife—in terms of game birds and mammals—for sport shooting. This will continue to be the approach so long as sport shooting is a recreational factor. Frankly, we are not interested in wildlife problems with this goal in mind, but we are interested—and vitally—in the maintenance of adequate numbers of all species. The only present course to assure this appears to be through such enlightened leadership among sportsmen as the Wildlife Conference reflects.

In this general comment on the Conference recently held, we must include one somewhat mystified comment on one phase of the meeting that should not be lightly dismissed. The Conference has never been a deliberative body. It has never passed resolutions, or taken votes. It is not attended by delegates from anything. It is just a conference and a discussional free-for-all. Yet, on two occasions, without any previous warning, those present at sessions were asked to vote—once on increasing the price of the so-called duck stamp from one to two dollars, another time on the proposition to open parts of wildlife refuges and sanctuaries to public shooting. It may be claimed that both questions were presented to obtain an "expression of sentiment." But both turned up in the public press as "votes," and will likely do so, also, before committees of Congress. In our opinion the North American Wildlife Conference holds too important a place in conservation to allow itself to promote pet ideas, or be a sounding board for special projects.



Moose are to be found in the Quetico-Superior region, but by no means in sufficient numbers to warrant the taking of these animals by gunners.

## Managing Quetico-Superior's Wildlife

By OLAUS J. MURIE

**A** WILDERNESS country lying across an international boundary, and one to which increasing numbers of people will be coming for their recreation, presents a special need for administrative teamwork. This is particularly true of the wildlife inhabiting such an area. A tract of forest is a geographical unit with more or less defined boundaries. A population of wildlife, however, is mobile and fluctuates in numbers from year to year. A dynamic resource, such as the animal life of the Quetico-Superior region, thus can hardly be designated as belonging permanently to one nation or the other. Animals will wander to and fro over the border. In border lakes, changes in the fish supply on one side are sure to affect the supply on the opposite side.

A similar situation was more dramatically demonstrated a few years ago by the case of migratory birds. Waterfowl that nest in Canada fly south into the United States and Mexico for the winter, to face a barrage of guns en route. Suitable regulation of shooting was needed in wintering areas in coordination with nesting conditions in the north. It was inevitable, therefore, that international treaties governing migratory birds should be consummated among the three countries.

The wildlife of the Quetico-Superior, of course, does not present quite as dramatic a picture. Nevertheless the area as a whole is a biological unit and the best wildlife management would be a coordinated one.

The agencies concerned—the Province of Ontario, the State of Minnesota, and the United States Forest Service—have an administrative interest in the total picture. An effective management plan would be one resulting from pooling of information by all agencies, and some degree of understanding among them about the broad objectives to be sought.

There are certain conservation principles that are becoming pretty generally accepted. Some of these are particularly applicable to a wilderness area.

It appears to be the consensus of experts that the waters of the Quetico-Superior country cannot maintain a fish supply adequate to meet intensive, mass fishing. This is already borne out by experience in some localities. On the other hand, the supply appears to hold up well under less intensive use by the wilderness traveler. The disturbing factor here is the airplane. It is now possible to fly a party of fishermen into a remote lake, and to take them out promptly with a liberal creel of fish. This weekend picnicking by air, of course, spells the doom of the fish supply. Furthermore, the use of the airplane dispels that particular appeal of wilderness fishing and wilderness travel for which the Quetico-Superior country is so ideally suitable. Fish management for this region could be both simple and inexpensive—to rely on natural reproduction, keep out the airplane, and leave the fishing to the wilderness traveler.

Management of the big game species—moose, deer,



and bear—could rest on the same general principles as those governing fishing, although there are some additional considerations. The sight of moose and deer along the shores of streams and lakes enhances the experience of any wilderness traveler. They are useful simply by being there. Whether or not, and to what extent, hunting should take place, and by what means, are matters that could well be subjects for study and discussion among the administrative agencies involved in the area. Certainly at the present time the moose population in areas we have visited is not large enough to warrant hunting. Management policies may be arrived at by study of field data correlated with the overall purpose of the wilderness area. Certainly the airplane has no place in the harvest of wilderness game.

But the wildlife of a region consists of much more than its big game and its fish. There are numerous creatures—the white-crowned sparrows that sing in the willows as you paddle by the shore, the thrushes that sing in the dusk, the loon out on the lake, the owl that you hear at night back in the pines, the red squirrel at camp, the deer mouse darting about to pick up your crumbs, the beaver that startles you by whacking the water with his tail. The list seems endless. These smaller creatures give meaning to the wilderness. Their ecological interplay among one another, and the vegetation and all the environmental forces, produce a dynamic, living wilderness. The management of these creatures consists of preserving their environment and leaving them alone.

There is still another wildlife group that requires study and planning for its inclusion in the fauna of the Quetico-Superior country. The marten and fisher, valued fur animals, have been trapped and poached in years past until they have been virtually exterminated. The fisher has become extremely scarce throughout the North American continent, except for certain favored areas where it has been given strong protection, or where civilization has not yet made itself felt. Here in the Quetico-Superior, of all places, such animals should find sanctuary. Here, also, we should tolerate such animals as the fox, lynx, "brush wolf" and the vanishing timber wolf.

There are few places in the country where we can have wolves. Conservationists are agreed that we should try to find a few localities where the wolf may survive as a species. Dr. Ian McTaggart Cowan, Professor of Zoology at the University of British Columbia, has made a notable study of the wolf in the Rocky Mountain national parks of Canada. His published report, *The Timber Wolf in the Rocky Mountain National Parks of Canada*, is well worth study. At its most recent annual meeting the American Society of Mammalogists, whose membership includes mammalogists of Canada and the United States as well as other countries, appointed a committee to work with governmental agencies in an effort to determine what places there might remain where the wolf species might be included as a member of the natural fauna. Surely the Quetico-Superior unit is admirably suitable for that purpose.

For a wilderness area, such as the Quetico-Superior, wildlife administration should be of the simplest kind. So long as the wilderness character is preserved, there is no need to maintain expensive fish hatcheries or game farms. What is needed is restraint and moderation in the take of game whenever that is permitted, and such restraint tends to result from the mere fact of the area being roadless, and if planes are excluded. Poaching of fur animals must be prevented, especially if marten and fisher are to be given another chance. The probability of a devastating over-population of deer, which occurs in some localities in spite of extensive hunting, is lessened if a few wolves remain in the country.

This is the kind of wildlife assemblage that naturally belongs in a wilderness. It is the type of wildlife that has always appealed to the wilderness traveler, and still serves to furnish the highlights and dramatic incidents in a present-day venture into that lake country. Such a wildlife assemblage has tremendous scientific value, as any ecologist will testify. This value will increase as the natural features of our country continue to be destroyed elsewhere. Wildlife management in wilderness should be the simplest and least expensive. It rests upon the decision to apply a wilderness policy to the region.

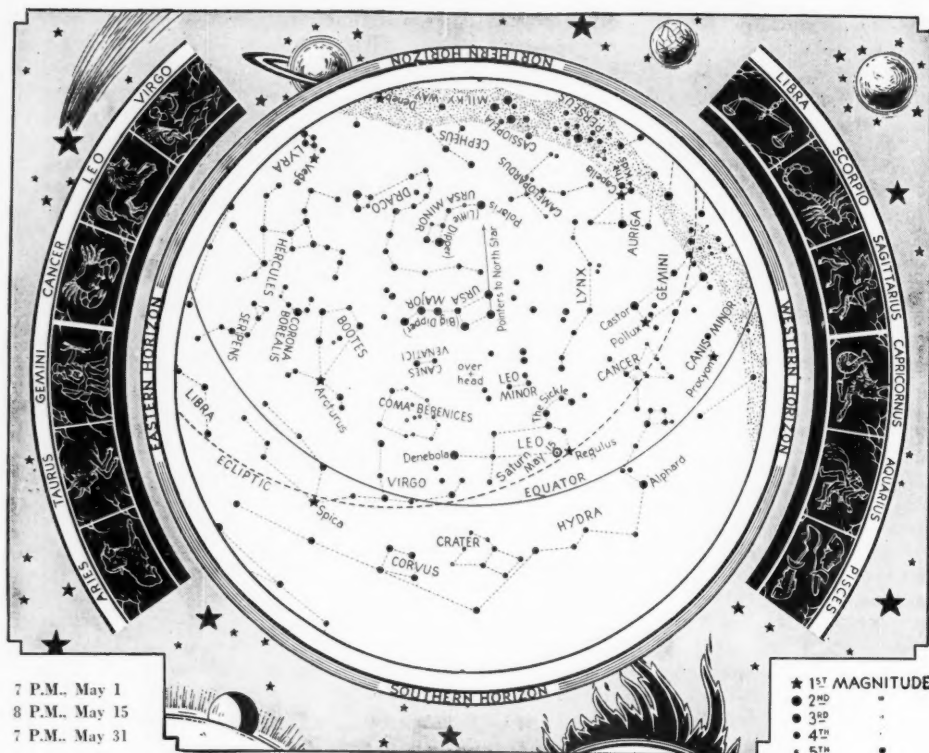


## Cicada's Song

By SYLVIA AUXIER

Above the crested waves of summer heat  
Cicada's needles dart unceasingly,  
Threading a strand of beaded notes, complete  
And sparkling as a jeweled rosary.  
Along the Nile a thousand years ago,  
sifting its sands, children would stop their play  
And root brown feet to hear this tremolo

Of needles clicking—as they do today.  
And all who will may hold its jeweled strand  
To thread the maze of vanished years and find  
That always-summer, ever-childhood land  
Within the meadow reaches of the mind,  
Where golden moments float, untold, along  
Uncharted channels—timeless as this song.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then, below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south.

## The Radio Telescope

By ISABEL M. LEWIS

**A**T Cornell University, in Ithaca, N. Y., a new type of telescope, designed through the co-operative efforts of mechanical, civil, and electrical engineers of that university, is now being assembled. The new instrument, it is expected, will be in operation in a few months and employed in pioneering work in the new and highly important field of radio, or microwave, astronomy. The investigations that are to be carried on with this telescope will be sponsored jointly by Cornell and the Office of Naval Research. This telescope will be one of the few of its kind in the world.

In some respects a radio telescope resembles the reflector-type visual telescope. The "mirror" of the Cornell instrument is a 17-foot, saucer-shaped antenna of wire mesh that collects inch-long microwaves from extra-terrestrial sources and passes them on for recording by means of electronic devices. It can

be rotated about four axes. It has polar and declination axes like those of an equatorial telescope, and, by rotation about these axes, it can be directed toward any point in the sky. It can also be rotated about a vertical axis for calibrating, and about the axis of the antenna for studies of polarization.

Unlike the visual telescope, which receives radiations vibrating in all planes, the radio telescope shows a preference for one plane of polarization. Astronomical telescopes of the visual type receive at one time a large range of radiation frequencies in the optical part of the scale of electromagnetic radiations, that is, in the visible spectrum. The radio telescope has only a small range in the microwave band. It performs functions of a spectrograph as well as a telescope. It has an amplifier and a device for recording the amplified signal. The sensitivity of the instrument decreases with angular distance

from the axis of the antenna, giving what is known as the acceptance pattern of the antenna. The wavelengths of radiations in the microwave part of the scale of electromagnetic radiations have a range extending from about a centimeter wave length, at the one end of the region, to ten meter wavelengths at the other end. These are the radio waves of high and ultra-high frequencies. In order to collect radiations in this region of only one centimeter wavelength an antenna of seven feet in diameter would be needed. For reasons of economy, and because of structural difficulties, radio telescopes cannot make use of microwave radiations much greater than a few centimeters in wave-length. The Cornell radio telescope, with its saucer-shaped antenna seventeen feet in diameter, receives microwaves an inch long.

This eight-ton radio telescope has been built to withstand winds up to 60 miles an hour. It is most pleasing to record the fact that radio telescopes are indifferent to weather conditions and function as well in stormy weather as when skies are clear.

The earth's atmosphere is transparent to radiations, not only in the optical part of the spectrum but in the microwave band as well. Practically all the information that has been acquired up to this time concerning the heavenly bodies—sun, moon, planets, stars, galaxies and inter stellar matter—has been attained through a study, analysis, and interpretation of electromagnetic radiations in the visible part of the spectrum, and adjacent ultra-violet and infra-red regions, that have penetrated the earth's atmosphere. This has been accomplished by means of the visual telescope, and such additional aides and devices as the photographic plate, the spectroscope, spectroheliograph, photoelectric cell, and coronagraph.

Now, within a period of less than twenty years, an entirely new field of radio astronomy is opening up through the discovery that the earth's atmosphere is transparent to microwave radiations, as well as to radiations from the optical part of the spectrum. Molecular absorption in the earth's atmosphere in that part of the spectrum that lies between the visual spectrum, on one side, and highest frequency microwaves, on the other, causes the atmosphere to be opaque to radiations in that region. The atmosphere is also opaque to radiations on the low frequency side of the microwave band. Several different strata of ionized gases in the atmosphere at several different heights, known as the ionosphere, impede the passage of low frequency radiations, rendering the earth's atmosphere opaque to them in varying degrees and at different elevations. The bouncing back to earth of these long radio waves of low frequency by the

ionosphere is what has made commercial broadcasting possible.

The penetrability of the atmosphere to microwave radiations from regions outside of the earth was discovered by Karl G. Jansky of the Bell Telephone Laboratories at Holmdel, New Jersey, in the winter of 1931, as a by-product of an investigation of high frequency atmospheric static. In a series of papers written on the subject Jansky showed that radio noises, or static, were received whenever the antenna of his instrument was pointed toward the Milky Way, and that the maximum disturbance came from the direction of the center of our Galaxy, which is known to be located in the Scorpio-Sagittarius region.

Jansky's observations were confirmed by Grote Reber and others, both in this country and abroad,

and solar and cosmic noises, as they were called, became well-known phenomena. Reber built, at Wheaton, Illinois, in 1936, an apparatus for studying these cosmic radiations and solar noises. The antenna was a metal sheet mirror thirty-one feet in diameter and twenty feet focal length. A survey made with this instrument, at a

frequency of 160 megacycles per second, showed that the region of maximum cosmic disturbance was in the direction of the galactic center, with regions of minor disturbances in Cygnus and other parts of the Milky Way. A most interesting observation was made by Reber and others concerning the radiations from this region in Cygnus. It was found that it was radiating much more energy than its surroundings, and that there was a variation in the signals with the time. They were of an irregular nature, fluctuating one or more times a minute. The region was found to have a diameter less than two degrees and, strangely, was not in any way remarkable astronomically. No bright star was near. It is located in a region of dark nebulaosity, and rather near a bright nebula is rich in helium stars. The North America nebula, so called from its marked resemblance to that continent, also is not far distant from this region. The radiations were received at 60 megacycles a second. Faint radiations have also been received from the direction of the Great Nebula in Andromeda.

Solar noises are known to be closely associated with the sunspot cycle and the occurrence of solar flares, and they cause great disturbances during periods of sunspot maxima, when all forms of solar energy are greatly increased as compared to the quiet sun of the sunspot minima. Jansky's discoveries of cosmic noises did not appear to include solar noises as well. In 1944 Reber announced reception of solar noises at a frequency of 160 megacycles per second. Publications of other observations (Continued on page 244)

## The Dauntless Voyager

By OSCAR GSTLUND

Above the maple tree, umbrageous,  
I see a form, courageous,  
A figure striding with a zest that is contagious;  
A voyager through the lights, superlative; a scion,  
Royal-born . . . the brave Orion.

# Camera Trails

By EDNA HOFFMAN EVANS

**L**AZINESS is a characteristic we all share, although some of us are lazier than others. Not all of us will admit being lazy. That is why, along in April and May, when the sharp wind turns to a soft breeze, when the trees don their new green leaves, and the birds sing joyously, most of us can work up excellent cases of spring fever, and still keep our consciences clear about laziness.

But spring is the time, too, when the Nature photography "bug" begins to bite harder than ever. There are flowers to photograph, baby birds in their nests, and subjects galore. How can we, as Nature photographers, pamper our lazy, spring-fevery selves and still take good pictures?

Would it not be fine if we could rig up some sort of a camera trap or "gimmick" that would take pictures for us by remote control—the remoter the better, especially if we could be off somewhere snoozing, secure in the knowledge that the ever-ready eye of our camera was watching and waiting for the exact right moment to click shut and record an especially good Nature picture?

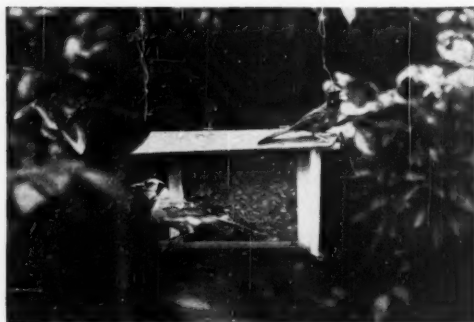
I have received several letters from Camera Trailsmen lately, asking about camera traps, special gadgets and electrical devices wherewith they could take pictures by remote control. Now, honestly, is not that asking a lot of your camera—expecting it to wait around and take a picture that you yourself are too lazy, or too inept, or too impatient to get?

Of course, there are such devices—a very few—but most of them are too expensive or too complicated for the average amateur. They are geared for special cameras, too—high priced, super-de luxe models that only one photographer in a thousand can ever hope to possess.

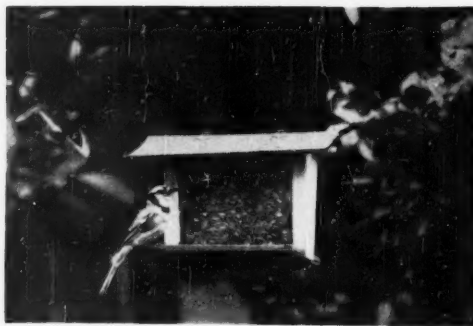
Taking Nature pictures is *your* hobby; do not shirk it. Your finger belongs on the trigger, or close to it. Keep it there. Do not try to pass the buck on to some electric-eye device or silly setup, à la Rube Goldberg, that would scare any self-respecting Nature subject clear over into the next county.

The foregoing, and most of what follows, is this photographer's opinion. Others may disagree. If so, I am willing to be convinced—I would like to be lazy, too.

The good old string-on-trigger is the only remote control device I have ever found to be worth the time and effort. I set the camera up, focus it on whatever I want to photograph, adjust lens aperture and shutter speed. This done, and before I pull out the slide, I tie a string to the trigger. The Graflex trigger is on the lower left side of the box. I am careful that the knot does not interfere with the trigger's movement.



I was particularly pleased to get both a jay and a cardinal on the tray together.



Blue jays make fine string photography subjects. No matter how many times they are frightened away, they always come back to the feeding tray for more sunflower seeds.

Then I carry the string straight down to some place on the tripod, so the final pull will be a direct one. Then I turn it at right angles and stretch the string as far away as I wish to be when the exposure is made, making certain that the string will not catch on stray branches, bushes or other obstructions. This done, I am ready to pull the slide and, from there on, I just wait at the other end of the string until my subject comes along. I may wait five minutes, or five hours. I may wait all day without success, and, when this happens, there is nothing to do but pack up and go home, pictureless. Maybe I will have better luck tomorrow.

This set-up will work with any camera, with modifications, of course, depending on the location of the trigger. Just be sure the final pull is in the direction the trigger is supposed to move. Be careful, too, that the string does not cross the lens or interfere with the moving parts of the camera.

The string itself is important. It has to be strong enough to stand a good pull without breaking, and it should not be any stretchier than necessary. Nor should it be too obvious—white cord stands out against foliage. Maybe it will not bother your subject, but, just to keep up the illusion of secrecy, and to provide strength and avoid stretch, I use black nylon fishline—about twenty-pound test—the same kind I use on my casting reel.

It is surprising how far away from your subject you can get and still pull the string. On the open beach, my hiding place has been so far from the camera that I have watched the crucial spot through field glasses. That is too far to hear the shutter's "click," but I have learned to gauge the amount of pull necessary to trip the shutter. A slow, steady pull is better than a sudden jerk.

Of course, your camera must be firmly anchored, otherwise the pull will dislodge it. A good, sturdy tripod will provide sufficient anchorage, especially if you push its legs firmly into the ground. But you do not need a tripod. If you want a nesting picture of some tree-dwelling bird, you can attach your camera to a nearby branch. You can bolt it to a board. You can tie it to a log. Any location from which you can focus your camera will do, as long as the camera can be attached securely to it.

Sometimes, in taking wildlife close-ups, your subjects refuse to come back as long as that funny black box is too close to their dwelling. Sometimes patience will solve this situation. If you can wait until the subject's fear disappears, after it has gotten accustomed to this new landmark, you can get an excellent picture. But that may mean leaving your camera in place over night, or even longer. Such treatment is not kind to cameras. A dummy camera may serve as stand-in, but then, when you change to the real McCoy, you may frighten your subject all over again.

I once tried to take a nesting picture of a wren that was





The reflector on the new Bolsley "B" synchronizer folds down behind the camera when not in use.

rearing her family in a greenhouse. Mother Wren did not have to worry about keeping her youngsters warm—the glass shelter was a perfect incubator. She had fed them sufficiently before I set up the camera so there was no need for her to return until sunset, when the light was too dim for photography. So I left the apparatus over night—but she was up earlier than I, and already gone before I arrived. Fearing that the wrenlets would get too hungry, I regretfully gave up and removed my paraphernalia. Mrs. Wren was a better waiter than I was.

String photography worked better in the back yard where I could focus on the feeding tray. Cardinals and blue jays shared a taste for sunflower seeds, and they paid little attention to the camera. Of course, not every picture was a good one. The illustrations are, I think, the best of a series of twelve, and two out of twelve is not a bad showing. In some, the bird was not in the right position. In others, there was too much movement—occasionally only the tip of a tail feather at the edge of the film showed that a bird had ever been there. But I was particularly pleased to get both a jay and a cardinal on the tray together.

The main difficulty is that, after each pull, the photographer must move up to the camera, change film, and reset the shutter. That, of course, frightens the subjects away and necessitates another wait until they decide to come back again. But that is something one can't avoid, and one that no electrical device or gadget will take care of.

And here is a word of warning. Be sure, before you do anything else, that the trigger has returned to place and that there is no tension on the string. Otherwise, the shutter may be tripped again and you will get an unwanted

double exposure.

The foregoing, I am sure, may sound very discouraging, perhaps even disillusioning, to the photographer who has been dreaming of super-excellent pictures via the remote control method. And I am not saying there is not any such method. But what I do maintain is that remote control photography is too complicated and too expensive to be worth the while of most Nature photographers. And I include myself in that category. If I can do the job with a string, why fool around with batteries, wires, and other complications? If I cared that much for electricity and gadgets, I would have selected some hobby other than Nature photography.

Incidentally, before writing this rather iconoclastic section, I wrote to Rochester, N. Y., one of the fountainheads of photographic knowledge. Robert W. Brown, head of Eastman's editorial service bureau and author of several books in the Little Technical Library series, published by Ziff-Davis, wrote the following:

"Speaking of camera traps, that letter of yours has just reminded me of the one and only time I ever tried to trap anything. I guess I was about 11 or 12 years of age, and while on a summer vacation at Martha's Vineyard I decided to trap a rabbit. Following the best Dan Beard recommendations, I rigged up a box with a trigger, lots of cabbage leaves as bait, and even went to the trouble of smoking the box to remove any vestiges of human odor. The box sat in the field where I knew rabbits were to be found for two months and eleven days. No rabbit. You can see why I have no faith in traps."

More specifically, from John W. McFarlane in the Eastman sales service division, came this reminiscence:

"I once strung a fish head on a string, tied each end of the string to a log, and ran a second string from this first string to my camera shutter. I expected a picture of a sea gull tugging at the fish head. What I actually got was a sea gull walking into my trip line.

"My only other attempt was with a burglar trap which was composed of a box camera to which I added a string to operate a flash shutter. It was installed in my mother's cottage to take a picture of any intruders over the winter. It did take quite an interesting picture of my mother coming in the following spring!"

And so camera traps, remote control devices, and electric eyes may sound wonderful to us lazy, spring feverish photo fans. But in actual practice they do not pan out well very often.

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chronizers. Among those newly equipped with such devices is the Bolsey "B". The synchronizer for this miniature camera is small and compact, and the reflector is arranged so that it folds down behind the camera case when not in use, thus avoiding some of the bulk of the usual flash attachment.

The Bolsey synchronizer is reported accurate at all shutter speeds from 1/10 to 1/100. Up to 1/50 almost any flash bulb will do; for higher speeds the use of SM or SF midget bulbs is recommended. The new flash unit sells complete for \$9.95.

For the photographer who develops only a roll or two of film at a time, and then wonders what to do with the extra solutions he has mixed up, Eastman has something better to offer. Now Kodak's top fine-grain developer, Microdol, is available in packet form, each packet containing sufficient developer to make eight ounces of working solution. Heat sealed aluminum foil wrappings prevent moisture from reaching the chemicals and keep them fresh and ready for use. With these small packets, no excess solutions need be left over, waste is eliminated, there are no chemicals to measure, and the whole darkroom storage problem is simplified. The packets sell for twenty-five cents each.

### Report on Elk

Results of a five-year study of the fall migration habits of the famous Jackson Hole elk herd have been reported to the Secretary of the Interior by Newton B. Drury, Director of the National Park Service. The studies were made by Victor H. Cahalane, James E. Cole and Carl E. Jepson. Pertinent to some of the controversy about Jackson Hole National Monument is the discovery that 55 percent of the herd never enters the Monument area but follow routes to the east of it. About three percent travel a mile and one half, or so, on the Monument land, and 25 percent stay within its boundaries for a distance of fifteen miles and are within Monument boundaries not more than two days. The balance cross the area in less than a day. The sum of the study indicates that the time any of the animals spend within the protection of the Monument area is brief compared with the hunting season. This seems to settle the argument of gunners that the Monument would deprive them of opportunity to shoot these animals, a none too sporting activity at best.

### Waterfowl Increase

Reports from the winter inventory of North America's ducks and geese, according to Albert M. Day, Director of the U. S. Fish and Wildlife Service, indicate an improvement in the numbers of most species. The total population does

not appear to have increased due to a heavy decline in coots, but stringent regulations for two years, favorable conditions in the breeding grounds, and the contribution of resting and feeding grounds through the United States refuge system are credited with creating an encouraging situation. No forecast of the 1949 season will be made pending summer breeding ground studies.

### Natural History Fieldbook

*Fieldbook of Natural History.* By E. Laurence Palmer. New York, 1949. McGraw-Hill Book Company. 664 pages. Illustrated. Textbook Edition from McGraw-Hill, \$5.00; Trade Edition from Whittlesey House, \$7.00.

Readers of *Nature Magazine* have a special interest in this important Nature book for, as the author says in his "Acknowledgments" that: "Much of the material is rewritten from special inserts that have appeared in *Nature Magazine*, of which the author has been Nature Education director since 1925. Permission to use this material and the helpful criticisms of readers of *Nature Magazine* have molded the nature of the book considerably."

"History, education, economics, and similar increasingly popular social sciences have on occasion showed us the error of our ways," says E. Laurence Palmer in his Preface. "They have defined problems that we must face in our increasingly complex civilization. Science has provided us with facts that may be used in solving these problems, and engineering and management have suggested ways of using these facts effectively. There has sometimes been a superficial conceit in the social sciences, and academic bigotry in the natural and physical sciences, and an impersonal, mechanistic routine in the technical fields that have failed to help the layman and beginning student use his immediate material environment in meeting the practical problems of the day. Much of the literature available to the average person has become too technical, too highly specialized to serve a practical purpose to him. It is to help meet this situation that this book has been written. It is hoped that this combination of philosophy, facts and techniques may help us all enjoy doing what must be done, when it must be done wherever we may be. This should lead to a sound citizenship, a national conservation policy, and a happy life."

In his text Dr. Palmer treats with more than 2000 items, and provides hundreds of pictures, all arranged and tabulated for easy reference. The descriptive matter follows the general format used in our tables in the special educational inserts. The result is a book immensely valuable for school and for home reference—to anyone interested in Nature. There is an amazing catholicity in the selection of subjects for inclusion. In sum, the author has prepared the kind of a book that he

says he would have liked to have had when he was a youngster, "as well as a book he can use now and in his old age to add the research and experience of others to what he may see for himself in his experiences with natural history." Dr. Palmer has admirably succeeded in providing such a book.

R. W. W.

### City of the Bees

*City of the Bees.* By Frank S. Stuart. New York, 1949. Whittlesey House, 243 pages. Illustrated. \$3.00.

On the dust cover of this book the publishers state: "Here is a book to delight nature lovers of all ages. With a rare combination of scientific accuracy and poetic insight, it presents a year's cycle in the life of a hive of wild bees and makes a fascinating and dramatic chronicle based on the author's personal observation." The book was first published in England, and enthusiastically reviewed there, apparently, however, only by critics who read it for its literary value. Certainly it was not submitted to any entomologist-reviewer, for had it been the present publishers might have been saved some embarrassment in respect of their phrase "... a rare combination of scientific accuracy. . . ." As a piece of writing this book is charming and poetic, and had it been offered as a combination of fantasy, fiction and what the author thought he saw in the life of a hive, it might have been accepted as such. Offered, as it is, for its scientific integrity, the reader must be forewarned that Mr. Stuart's observations are in many cases inaccurate and his interpretations hopelessly anthropomorphic in any publication pretending to scientific exactitude. It is sad, too, because Mr. Stuart writes beautifully.

R. W. W.

### Knowing the Birds

*How to Know the Birds.* By Roger Tory Peterson. New York, 1949. The New American Library (Mentor). 144 pages. Illustrated. \$3.50.

If this review strikes a familiar chord it will be because of our review of the same book last month. It was the same book now before us, textually, although in different physical form, and from the presses of Houghton Mifflin. This present little pocket book is designed for sale in drug stores and on newsstands where these Mentor books are found. We regard this as an important departure, one calculated to reach out and bring into the fold a considerable number of bird-studying recruits. Such an inexpensive introduction to bird knowledge has been sorely needed, and it is a happy circumstance that this introduction is now provided by Roger Peterson. We hope that this may mean other authentic, sound and inexpensive introductions to other fields of Nature knowledge. However this piece of publishing teamwork was worked out, more power to it.



## WILDLIFE WONDERLAND

(Continued from page 214)

Hole, but throughout the West.

Elk and moose swim the river to enter the Park area. The elk bed down for the night in aspen groves on the higher slopes, while the moose remain in the willow thickets along the wetter bottom land. By day bands of elk often join the buffalo herd in feeding on the grassy flats. Their young may be left in the shelter of the willows early in the season, but later the little ones accompany their mothers into the open. Each evening, when the various families reunite in the trampled runways through the leafy thickets, the air echoes with the clear, high, short calls of elk to elk—a sound the visitor does not soon forget.

Bull elk are growing antlers during the summer, and band together, for the most part in bachelor groups, while horns develop under the thick protective velvet. As fall approaches, the animals become less timid, but, unlike the moose, they wear their antlers all winter. The elk in the Park may eventually lose some of their migratory instincts, but they are part of the many animals that shift regularly southward from the high country toward the lower end of Jackson Hole each autumn, and back again in spring.

Moose are not nearly as abundant as the elk, but are so widely scattered in the region outside the Park, and find their way into the conservation area with such regularity, that no attempt is made to keep them. They seem less wary than the other large animals, and can be photographed from a discreet distance at almost any time of day. On the other hand, the bulls shed their antlers in late December or January, and have not grown replacements of any size until well along in the summer. This makes it more difficult to find spectacular moose than well-antlered elk. Moose calves, born during the early part of June, remain close to their mothers. They are reddish in color, not spotted, and not brownish-black like their parents. With large rounded muzzle and ridiculous "dangler" under the chin, a homelier animal than a cow moose or calf would be hard to find! Yet to see a mother and offspring wading in a pond, or the youngster swimming around while the parent browses on the bottom vegetation, gives a thrill of delight to any traveler.

Often the young elk, deer and pronghorn antelope are found where their mothers had concealed them in the undergrowth. A few such seeming orphans—actually not so—have been taken into Wildlife Park headquarters and raised by hand. They are growing into handsome animals, and are so unafraid of man that they may be observed continuously at short range. Other unusual pets, free of the ordinary fears, include porcupine, mink, otter and fox. Several of these, fed

in the field, present rare opportunities to the student of animal behavior and to the photographer. Beavers, badgers, martens, muskrats, weasels and coyotes are also common enough in the area for study.

On islands left by the meandering Snake among its back eddies, various water birds have found nesting places on low ground. Above them, in the tops of tall, dead trees, are the saucer-shaped nests of Treganza's great blue heron. During the summer the big adults, returning with food for their long-necked young, can be seen from the highway, flying along with necks folded neatly over the back while long legs trail behind. Rarer, and more spectacular, are the sandhill cranes, which breed in the vicinity and can be watched—usually flying, with both neck and feet extended, often honking out an alarm cry suggestive of the musical train of tin cans tied behind a newly wed couple's car! And on the broader reaches of the river swim white pelicans—several pairs of which nest not far away.

Few forms of wildlife are as close to extinction as the trumpeter swans, the North American remnant numbering a few hundred. Of these a few are permanent residents on the Federal Elk Refuge near Jackson, while others winter on warm spring areas in northern Jackson Hole. Elsewhere they have difficulty in rearing their cygnets to the flying stage before ice forms on their ponds and streams. Those on the Elk Refuge are a treat for early morning travelers on U. S. Highway 187, since they come close to the road with their two to four graceful young, feeding under the watchful eyes of the mother and father.

Ravens, bald and golden eagles, ospreys and Canada geese are other familiar birds of the Wildlife Park area. And, on the higher land around the rim of Jackson Hole, the water ouzel nests under mountain cascades and dips through the shallow water in search of insect food. Pikas, one of the closer relatives of the rabbits, live in rock slides, where they spend the summer laying up a store of hay for winter food. With care, they can be observed spreading plants on a sunny ledge to dry, or pulling in this future food to shelter if a thunderstorm appears.

Even the lesser animals of the area are numerous and extremely interesting. Several kinds of hummingbirds attend deep-throated flowers, such as the scarlet *Gilia*, and the Indian paintbrush, state flower of Wyoming. *Parnassius* butterflies, with rounded, ivory-colored wings sparsely marked with black and red dots, descend from the high meadows above timber line to visit fields golden with western sunflower, or purple with lupine and sagebrush. Western toads, with a yellow stripe down their backs, hop solemnly through the shaded spring runs. Fat, brown, Mormon crickets hide among the tall grasses, or climb the stouter stalks to get the

seeds. Harmless snakes—there are no poisonous ones known from Jackson Hole—watch from the thickets. Each of these and the many other animals that thrive in the area have a firmer grip on the future, now that the Wildlife Park has been set aside for their conservation and study. Until the Jackson Hole National Monument is properly supported in the interests of the general public, the Wildlife Park will help to maintain the present wealth of life and provide for the traveler an intimate view of the larger mammals and birds in natural surroundings. The "Old West" can persist for coming generations to see, and this north-west corner of Wyoming can provide a haven for the native creatures of our land.

### Alluring Workshop

Were it possible to be in several places at once, and if distance could somehow be magically overcome, we would certainly like to take part in the Natural Resource Use Workshop being conducted this year from June 13 to 24 by Fresno State College under the direction of Leo F. Hadsall. The first session is an orientation day at the College, but the intervening days consist of field trips of alluring variety and interest. On June 24 the experiences of the field studies will be tied up with a final session at the College. Space does not permit further details but Dr. Hadsall will be glad to supply them. Write him at Fresno State College, Fresno 4, California.

### New Products

From Smith Kleener Klaw, Box 272, Lexington, Michigan, comes a gadget designed to please the fisherman who does not enjoy, or is not adept at, holding the fish he is cleaning. It is a simple device made up of a pointed blade that goes into the fish's gullet, and a hinged clamp. Together these provide a secure grip on the piscatorial prize being prepared for the pan. Sixty cents each, one dollar for two. . . . From House of Hofman Ceramic Craftsmen, 623 Beech St., Toledo 4, Ohio, comes a reproduction of an old English wren house made of Ohio china clay. It is glazed dull green, has drain holes in the bottom. Costs \$3.25.

### Biology Club

From R. Mark Ryan, 15035 Sutton St., Sherman Oaks, California, comes word of the formation of the Notre Dame Biology Society of Notre Dame High School of that community. President Ryan suggests that we might wish to carry a note of this event "asking interested persons to contribute biological specimens, books and popular papers, subscriptions to magazines, or to lend financial assistance to aid the group in getting under way." There you are, Mark, and best of luck.



# THE READER'S MARKET

A place where members of the American Nature Association and readers of Nature Magazine may find many interesting offerings or may advertise themselves, at low cost, for things wanted; things they have for Sale, for Trade, for Sale or Trade. This is an excellent forum for acquiring or disposing of such items as binoculars, books, cameras and photographic equipment, magazines, sports and outdoor equipment, etc.

## GENERAL REQUIREMENTS APPLICABLE TO CLASSIFIED ADVERTISING

1. *Transactions based on good faith:* Transactions are based on good faith and mutual satisfaction. Deliberate misrepresentation, disregard of usual business ethics or the attempt to circumvent these general requirements, when brought to our attention, will result in refusal of further advertising.

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3. *Who may advertise:* This department is an open market trading post. Any individual or firm whose advertisement and methods of doing business meet our requirements may advertise their goods or services.

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likewise are counted as one word. Hyphenated words are counted as two words.

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not acceptable. The terms "fair price paid" or "state price wanted" may be used.

9. *Blind ads not acceptable:* Box number or blind ads will not be acceptable. Give your complete name and address to insure prompt delivery of all mail or telegraph replies.

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11. The association will not accept for publication in NATURE MAGAZINE, advertisements of firearms, ammunition, or patent medicines.

12. *Responsibility for illegible copy:* Type or print advertisement plainly as we cannot be responsible for errors due to illegible writing.

13. *Closing date:* The closing date of all advertisements is the 20th of the second month preceding month of issue.

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BUTTERFLIES: 15 named U. S. butterflies, moths, including Giant, Green Tailed Luna, \$2.00. 15 named World Butterflies including German Peacock Butterfly. \$2.00. M. Spelman, 2781 Grand Concourse, New York City.

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### PHOTOS

YOUR BETTER NEGATIVES cropped, reprinted, 3 1/4 in. square to 3 1/2 x 5 1/2—6¢ each. 6 alike 30¢; 4x5—10¢, 3 alike 25¢; 5x7—20¢, 3 alike 50¢; 8x10—35¢, 3 alike 90¢. Intermediate sizes same as next larger. Commercial Photo Service, Marcelona, Michigan.

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### POEMS WANTED

POEMS wanted for musical setting. Send poems for FREE examination. Hannan Service, 690 Manhattan Building, Milwaukee, Wisconsin.

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SEA SHELLS appeal to Nature Lovers. Try these offers today: 12 Attractive Land Shells, \$1.00; 12 Marine Shells, \$1.00; 5 Odd Marine Specimens, \$1.00. Lot of beautiful polished and unpolished shells on request. Mrs. F. K. Hadley, Box 33, West Newton, Mass.

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## THE RADIO TELESCOPE

(Continued from page 237)

at different microwave frequencies soon followed. It is now certain that solar noises are caused by penetration of the earth's atmosphere by microwave radiations at all frequencies and that such noises are recorded most frequently during sunspot maxima periods.

It is not possible to do more than mention here the importance of microwave radiations in the study of meteors, or the fact that radio echoes have recently been received from the moon. Of special interest is the possibility that meteors may be discovered by the reception of microwave radiations from their trails.

Although twenty years have not yet elapsed since Jansky made his momentous discovery, which is opening up an entirely new field of astronomical research, the extent of the investigations that have already been made of the source and causes of extra-terrestrial microwave radiations is remarkable. Not only in the United States, but even to a greater extent in other countries, especially in Canada, England, and Australia, there is great activity in the field of radio astronomy. The National Bureau of Standards is actively engaged in the development of radio technique through its Central Radio Propagation Laboratory. Discussions of some of the problems of radio-wave propagation at high frequencies are presented in an interesting Bureau of Standards publication entitled *Ionospheric Radio Propagation*, issued last year.

It may be in order to note here that observations, made quite recently by Dr. Edwin Hubble with the 200-inch Hale Telescope on Palomar, have revealed the existence of a nebula at a distance of a billion light years. Further polishing of the mirror to remove the 20-millionths of an inch bulge around the edge of the mirror will be undertaken to perfect the telescope. It appears that at present the mirror is better than the seeing; that it seems to be good enough now for observations with the spectrograph, and that the photographic images are at times very good.

This is the best time of year to observe Mercury in the evening sky. It will be at greatest eastern elongation on May 10, and best seen the first half of the month. It will be about 18 degrees above the western horizon at sunset on May 10. By the end of the month it will be lost to view in the sunset. Venus is now in the western sky, but too low to be seen to advantage this month. At the end of May it will be only ten degrees above the western horizon at sunset. Mars, now in the morning sky, is too close to the sun for observation this month. Jupiter is visible from shortly after midnight until

sunrise in the southeastern sky. It is in Capricornus. Saturn is now in Leo and sets shortly after midnight. It will be interesting to watch its motion during the month relative to Regulus close by it.

## Pennsylvania Booklets

Two attractive and useful booklets come to hand from the Pennsylvania Game Commission at Harrisburg. One is a new bulletin entitled "Pennsylvania Birds of Prey," the joint work of Robert D. McDowell and Leo A. Luttringer. This is a 32-page, illustrated booklet discussing objectively the appearance and habits of the hawks and owls found in the Keystone State. It is designed to aid in the identification and understanding of these birds, most species of which are protected by Pennsylvania law. The price is twenty-five cents. The other booklet is a second and revised edition of "Pennsylvania Birdlife" by Hal H. Harrison, 72 pages with illustrations in black and white and color, the latter consisting of six full-page color plates depicting 124 birds. These plates are available also in large chart size—26 inches by 30 inches—at fifty cents a chart, and the booklet costs fifty cents a copy. Order from Pennsylvania Game Commission, Harrisburg, Pa.

## The Otter

*Tarka, The Otter.* By Henry Williamson. New York, 1949. E. P. Dutton and Company. 260 pages. \$3.00.

When it was first published in 1928 this book was welcomed as an outstandingly beautiful Nature story. It was enthusiastically reviewed and received. We have no knowledge as to the size of the original edition, but it is a book that has for some time been out of print. And, in the two decades that have passed, it has achieved somewhat the position of a classic. Now it is again available, with an introduction by Sir John Fortescue, for a new generation of readers of Nature stories. If they have not before met Tarka they now have the opportunity.

## Conservation Camp

Two sessions of the New Hampshire Conservation Camp conducted by the Society for the Protection of New Hampshire Forests, 3 North State Street, Concord, N. H., will be held this year. The sessions are held in the Bear Brook State Park, near Allenstown, and are one week each. They offer a unique opportunity for conservation training of both young people and youth leaders.

## Forest Farming

"Forest Farming and Rural Employment" is the title of the most recent report published by the Charles Lathrop Pack Forestry Foundation, 1214 16th St., N. W., Washington 6, D. C. It is the work of Charles H. Stoddard, and is based on a

study of two areas in northern Wisconsin and southwestern Arkansas. Recognizing a relationship between meager application of good forestry management on private lands and rural unemployment, the study seeks to indicate how the application of the former may contribute to the amelioration of the latter. Thus this report has a socio-economic significance of much wider concern than that which ordinarily involves the forester.

## Ecuador and Galapagos

*Ecuador and the Galapagos Islands.* By Victor Wolfgang von Hagen. Norman, Oklahoma, 1949. University of Oklahoma Press. 290 pages. Illustrated. \$3.75.

Ecuador is a fascinating country, historically, physically, and in the variety of its natural resources. And the cinderly Galapagos Islands, possessions of Ecuador, have a noted historical and natural history significance. Wolfgang von Hagen knows both well, and in this book has written a lively and interesting history of this region.

## Efficient Helicopter

Helicopters may not be the prettiest machines in the air, nor do they break speed records and otherwise break spectacularly in the headlines, but the U. S. Forest Service gives them a pat on the back—if you can pat a helicopter on the back—as the most efficient means of re-seeding burned-over mountain watersheds. Of proved value in forest surveys and fire control, these flying windmills add a new conservation achievement to their reputation.

## Look Out, Polluters!

Under the provision of the law establishing at least a degree of pollution control, a Water Pollution Control Advisory Board was created, representing various interests. One representative speaks for the conservationists, and Carl D. Shoemaker of the National Wildlife Federation has been named by President Truman to this responsibility. Mr. Shoemaker has a broad background of activity in the conservation field, and certainly has had a wide opportunity to observe pollution and its effects.

## Forest Reappraisal

In his message to the 81st Congress, President Truman placed particular emphasis on the importance of conservation of natural resources, stressing the need of placing our forest resources on a sustained yield basis. Thus the publication of "Forests and National Prosperity" as Miscellaneous Publication No. 668 of the U. S. Forest Service is timely. This is a reappraisal of the forest situation in the United States and a recommendation of the course we should follow in the light of that reappraisal.

## Many Mallards

Mallards make up one-third of the waterfowl wintering in the continental United States, according to the report made to Albert M. Day, Director of the U. S. Fish and Wildlife Service, by those engaged in the winter inventory. Pintails were the second most numerous wintering waterfowl, while buffleheads, swans, American brants, black brants and blue-winged teal were the scarcest. Most significant trends revealed by the inventory within the United States were increases in snow geese, scaups, black ducks, mallards, scoters and eiders, while shovellers and mergansers decreased. The inventory is reported, also, to have revealed an estimated twelve percent increase, continentally, in ducks and thirty-two percent in geese.

## Guatemalan Mosses

*Mosses of Guatemala.* By Edwin B. Bartram. Chicago. 1949. Chicago Natural History Museum. 442 pages. Illustrated with botanical drawings. \$4.00.

This is the twenty-fifth volume in the "Fieldiana" series, and is based upon material collected in the course of three botanical expeditions to Guatemala by Drs. Paul C. Standley and Julian A. Steyermark of the Chicago Natural History Museum, supplemented by explorations in the Guatemalan highlands by Dr. Aaron J. Sharp. The author has studied all these collections and performed a notable work of organization into a valuable and specialized botanical work. Fifty families of mosses are covered.

## Anatomy

*Comparative Anatomy.* By Leverett A. Adams and Samuel Eddy. New York. 1949. John Wiley and Sons. 520 pages. Illustrated. \$5.00.

This anatomy textbook replaces *Introduction to the Vertebrates* by Dr. Adams, published in editions brought out in 1933 and 1938. New discoveries and viewpoints have brought about the rewriting of most of the text and the change of title. The first part of the book is a review of the classification of the different groups of the vertebrates, while the second part is devoted to comparative study of the organ systems of the vertebrates.

## Mexican Conservation

Dr. Ira N. Gabrielson, president of the Wildlife Management Institute, recently visited Mexico and reports that he is greatly encouraged by the growth in the conservation sentiment in Mexico in the last 10 to 12 years. While the total number of those interested in conservation is still small, it is many times the number that existed on previous visits which began about 1937. He found both authorities and private citizens interested in conservation of wildlife and eager to secure sound conservation material which could

be translated into Spanish and used in the admittedly tremendous job of education which they face in Mexico. The Institute has arranged to supply all available information in order that the educational movement may gather as much momentum as possible.

This will be a long-time job since there is still a high percentage of illiteracy among the Mexican people and many of the Indians still live under primitive conditions. Any conservation education program must be sustained for many years to accomplish results. The growing interest in conservation on the part of officials, university people, and private citizens, however, indicates that there is now an excellent chance that such a program will grow and will become a permanent part of the educational effort in that country. Mexican officials freely admit the shortcomings of their present conservation movement, Dr. Gabrielson said, but the determination of these men to do something about the problem in the face of tremendous obstacles lends encouragement for the future.

## National Park Films

Twenty-four motion picture films of National Parks are listed by World in Color Productions, Elmira, New York. This firm announces that it will send an illustrated brochure listing the full color park films for four cents in stamps.

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# Under the Microscope

By JULIAN D. CORRINGTON

## THE BUGONIA MYTH

EVERYONE who is conversant with even a smattering of Nature lore knows that there are numerous superstitions concerning snakes, eels, salamanders, and many other vertebrates, based on ignorance and faulty observation. It is not so well understood that there are also absurd and peculiar beliefs associated with insects, and especially with that insect whose symbiosis with man has been longest and closest—the honey bee.

*Apis mellifera* (*Apis*, bee; *melli*, honey; *ferre*, to bear) or *mellifica* (*ficare*, to make) has been kept in some sort of hive since before the dawn of history and scarcely any animal on earth has been studied, in its natural habitat, so diligently and so thoroughly as the bee. Something like 25,000 titles of papers and researches and literary productions are known to exist, dealing with the bee. Apiculture, or bee-keeping, is both a science and an art, of ancient lineage and widespread practice.

Such being the case, it is nothing short of phenomenal that for some three thousand years, down to a period a little more than two hundred years ago, one of the greatest Nature-fakes in history was a matter of standard belief in regard to bees. The life of the hive was known—the production of a new colony by swarming, the various brood cells and storage cells of the comb, the life cycle that involved egg, larva, pupa, and adult, as well as the castes of adults and some of their functions and activities. Yet alongside this lore lodged the ridiculous superstition that bees could also be produced by spontaneous generation from the decaying carcass of an ox.

In Greece, the term *bugonia* was applied to such oxen-born bees, from *bous*, ox; *gony*, progeny. In Latin, the terms were *Bugenes mellissae* or *Taurigenae apes* (*taurus*, bull). According to William Morton Wheeler, distinguished American student of social insects, the belief that bees could issue from carcasses, chiefly those of oxen, arose in Egypt. In that land, *Apis*, the bull, was a reincarnation of the sun-god, Osiris, one of whose symbols was the bee. Yearly the Nile inundated the "granary of the world," covering the land with a rich alluvium that rendered fertilizers unnecessary; yearly the waters receded and a splendid harvest followed. A prosperous and grateful people offered up sacrifices to Osiris and made pilgrimages to the sanctuary of the particular bull that happened to be serving in the role of *Apis* at that time. Small wonder that the highest function of Osiris was as god of the Nile. Horus, the son of Osiris, was also a sun god, identified by the Greeks with Apollo, and one of his symbols was the fleur-de-lis, believed by many to represent a conventionalized honey bee rather than a flower.

When valuable honey bees were seen issuing from the body of a slain bull, were they not sent by a divine providence to provide honey for the populace? Life from death—a dim foreshadowing of the now commonly known nitrogen and carbon cycles in Nature—was a concomitant to the familiar ashesto-ashes philosophy. Like the periodical flooding and retreat of the Nile, like the fleur-de-lis, the bugonia came to stand as a symbol of resurrection.

Various writers among the ancients have described for us the ritualistic performance that came into use in order to secure a swarm of bees by sacrificing an ox. The best known account is probably that of Virgil, in his *Georgics*, where ex-

plicit directions are given: The animal must be killed in the spring, when the sun is in Taurus, the zodiacal sign of the bull; it must be selected with care, according to specifications; it must be clubbed or suffocated, so as to retain the blood; the apertures of the body should be stopped with cloths so that the vital spirits within may not escape.

From Egypt, the bugonia legend spread throughout the ancient world, becoming more elaborate and formalized as time passed. The Greeks, Carthaginians, and Romans all speak of producing bees in this manner as a commonplace occurrence. Among the Hebrews, Samson is supposed to have discovered a honeycomb in the carcass of a lion—a variation of the usual theme. Archelaus, the poet, writes of the "factitious progeny of a decaying ox."

The elaborate symbolism of the religious cult of Mithras, a Persian god, likewise inherits much of the Egyptian *Apis* worship. Mithras, or Mithra, was an earth-born hero who captured and slew the divine bull, from whose body then sprang all of the beneficial plants and animals. The mortal then ascended to heaven as an immortal, Mithras Tauroctonus (the bull-slayer), who now watches over his faithful people until the time of his second coming, when all evil shall be destroyed and the good shall enjoy eternal life. There are many points in common between this cult and Christianity, and, in fact, Mithraism was widely adopted by the Roman Legionnaires, who spread it throughout the empire to the point where it was long a question as to which religion should finally dominate Western civilization.

Wheeler mentions that among the objects taken from the tomb of Childeric I, King of the Franks, who died in 481, were a golden bull's head and 300 golden bees, set with precious stones and furnished with clasps for fastening to the king's mantle. Childeric had been initiated into Mithraism, involving the taurobolium, or baptism with bull's blood, as well as the use of honey and wearing of golden bees to signify rebirth. The spilled blood of a bull in general indicated fertility and resurrection, associated with bees as the form taken by the new life. Charlemagne is said to have worn the golden bees on his coat of arms, and those embroidered on the robes of Napoleon I were to symbolize his supposed descent from the great Carolingian monarch. The Lilies of France, or fleur-de-lis, in all probability owe their existence to and represent a surviving vestige of the bugonia myth.

In the later middle ages, with the bugonia legend continuing to develop side by side with apiculture, allusions to the oxen-born bees are frequent. Melancthon, German Lutheran reformer, 1497-1560, stated that the occurrence of bugonia was a divine provision to lighten the burden of men, thus bringing the belief within the Christian tenets. One of the more important writers on natural history, Ulisse Aldrovandi, in 1602, described the transformation of the white and footless grub into the winged and yellow bugonia. Even the great Florentine poet, naturalist, and court physician, Francesco Redi (1626-1698), believed in and wrote about bugonia. His very modern experiment with blowflies, proving that they hatch from eggs laid on decaying meat and not from spontaneous generation, is known to all students of biology. Yet, paradoxically enough, he failed to observe exactly the same thing taking place in the case of the bugonia, and turned from scientific common sense to superstition.

The old saying, that where there is a lot of smoke there must be some fire, will doubtless occur to any reader of this account. Not until publication of a celebrated work, *Mémoires pour servir à l'Histoire des Insectes*, 6 volumes, 1734-42, by the great French naturalist, inventor, and philosopher, René Antoine Ferchault de Réaumur, was any light thrown on this amazing mystery of the bugonia. That people through the ages had seen something issuing from the carcasses of defunct mammals could scarcely be doubted. But Réaumur showed that the insect that seems to develop spontaneously from a dead ox was not a bee at all, but, instead, a syrphid fly, *Eristalis tenax*, the adult of which is often termed a drone fly while the larva is called a rat-tailed maggot. Other names for these and related flies that



mimic bees include hover flies, sweat flies, flower flies, and bee flies. Some resemble honey bees, others bumble bees, and still others look like wasps to the uninitiated.

The female *Eristalis* deposits its eggs in a carcass, the larvae feed upon fluids that result from putrefaction, breathing air through the long rat-tail process and, in due time, develop into winged flies that superficially resemble bees. Réaumur also described *Heliophilus*, a related genus of flies that look like wasps and whose females seem to prefer dead horses rather than oxen, this being the source of a parallel myth of horse-born wasps, known of old but lacking the economic and symbolical importance of the bugonia. To the present-day student it seems strange indeed and grossly careless, that observers through three millennia should confuse the larger, fatter, two-winged fly with the four-winged bee; they differ in all respects save a vague resemblance in size and coloration. The layman may not wish to scrape up close enough acquaintance with bees to observe their construction minutely, but many of the past reporters have been naturalists and scientists, and much intricate knowledge of the bee had accrued. Needless to say, no one seems ever to have followed up all of the elaborate instructions for obtaining bugonia to the point of hiving them; the authors of antiquity are uniformly silent on the point of actual production of honey by the bugonia.

The most important study dealing with this subject was made by Osten Sacken in 1894. The career of this man is an interesting one. Born Robert Romanovich Osten-Sacken, in St. Petersburg, Russia, 1828, he became better known later as the Baron Carl Robert Osten Sacken (dropping the hyphen) and, in English-speaking countries, as the Baron Charles Robert Osten Sacken. Educated in his native city, he embarked at once at the age of twenty-one on the simultaneous careers of a diplomat and an entomologist, becoming connected with the Imperial Foreign Office in 1849. During his residence in the Tsarist capital he made extensive insect collections and published several papers, specializing in the diptera even this early. He came to the United States in 1856 as Secretary of the Russian Legation in Washington and in 1862 attained the position of Consul-General for his country in New York. In spite of the demands such offices made on his time, he became noted as an authority on the diptera, publishing many papers, as well as a Smithsonian *Catalogue of the Described Diptera*.

Resigning his official position in 1871, Osten Sacken, the private citizen, remained in the United States until 1877, studying the flies of North America and authoring two comprehensive catalogs that were again government publications. Removing to Germany, he continued his

work on flies with Hermann Loew. Essig states as his opinion that one of Osten Sacken's greatest contributions to U. S. entomology was the packing and transmitting in safety of Loew's collection of North American diptera from Guben, Germany, to the Museum of Comparative Zoology at Harvard. Osten Sacken's own collections are divided between this museum, Philadelphia, and Leningrad.

His last work was his autobiography, published when he was seventy-five years old, three years before his death—a work that constitutes an historical account of entomology for his period. His biographers stress his perfect manners, accuracy of work, remarkable memory, mastery of many languages, independent means, huge library, and other attributes that made him an ideal scientist.

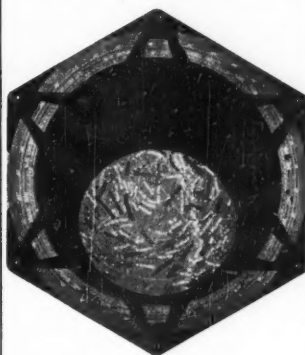
In some references he is given credit for the final overthrow of the bugonia myth, although such citations overlook the work of Réaumur, more than a century and a half earlier. However, Osten Sacken's labors in this field were much more detailed and we are indebted to him for a comprehensive historical research on the facts and significance of the bugonia legend. The guilty culprit, *Eristalis tenax*, is now widely distributed over most of the world and is abundant in the United States. Interestingly enough, it was first discovered in America by Osten Sacken himself, at Cambridge, Massachusetts, in 1875. The celebrated Russian dipterologist died at Heidelberg in 1906.

## BEGINNER'S PRIMER

Syrphid flies, Family Syrphidae, are more familiar to most persons than are many of the kinds of flies previously discussed. To some, they are the hover flies or drone flies; others call them sweat flies, or perhaps flower flies or bee flies, although certain of these terms apply also to other families and are more or less ambiguous. Hover fly refers to the fact that some of these insects will hover in front of a flower, seeming to hang motionless in the air, the wings beating so rapidly as to be invisible. The fly will then dart away with great rapidity to some other nearby flower and again hover. Many of the species make humming or droning noises with the wings, like those produced by bees. Some syrphids mimic honey bees in general form and coloration, being often mistaken for hymenoptera by the uninstructed; others resemble bumble bees, some look like wasps, while others appear totally different from any of the bee-wasp group.

The family is a fairly large one, with some three thousand species. These range from small to large in size, and with very few exceptions may be distinguished by the presence of a *spurious* vein in the wing, lying between the radius and the media, free at both ends, and consisting of a thickening in the wing membrane that looks like a ghostly sort of vein and

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is thought to be the vestige of a former longitudinal vein. The antennae are three-jointed and provided with a style or arista, which may be plain or plumed. The head is large, legs normal, wings large. The adults feed upon nectar and are valuable for their work in cross-pollinating many flowers.

It is with the larvae, however, that we meet with a tremendous range of habit and habitat, exemplifying many biological principles. In the genus *Microdon*, the larvae resemble slugs rather than maggots and are to be found within ants' nests, where they feed on the excreta of their hosts, acting as scavengers. *Syrphid* larvae look more like conventional fly maggots. In *Syrphus*, the larva is somewhat flattened, elongate, and triangular in shape, and has an amazing behavior indeed for a footless and essentially headless, worm-like creature; for it sails into a colony of aphids while these are feeding on some plant, and devours large numbers, then will travel to another cluster and wipe them out too, thus doing a great deal of good from the human economic standpoint. *Volucella bombylans* dwells in the nests of bumble bees in Europe. Some species of *Tubifera* live in wounds made in trees, whereas *Temnostoma* is an active wood-borer. *Merodon* infests bulbs, such as those of tulips, eating out the centers.

Many other habits are represented, but, of them all, strangest is that of such larvae as *Eristalis tenax*, the drone fly, basis for the Bugonia Myth that forms the subject for our feature article this month. These are the notorious rat-tailed larvae that feed among liquids resulting from the decay of organic matter, plant or animal. The maggot dwells completely immersed in the fetid fluid, but is enabled to breathe by means of a device somewhat recalling that of mosquito larvae, although much more elaborate and efficient. The hind end of the body tapers off into a long, tail-like air tube or respiratory "periscope," which is extensible, like a telescope, and can be adjusted in length to suit the depth of the maggot below the fluid surface at any given time or place. The "rat-tail" consists of a pair of parallel tracheae, ending in spiracles surrounded by a rosette of plumose hairs that spread out along the top of the water and, by surface tension, act as a float to keep the spiracles out of the liquid. These "tails" may be as long as the body or several times as long. Essig states that in *Myiatropa florea*, European species, the tube is twelve times the length of the body and attains to the remarkable dimension of nine to ten inches!

Some syrphids, both adults and larvae, are small enough to make satisfactory and interesting whole mounts; others are too large, but provide mounts for representative slides of wings, the aristate antenna, and all or a part of the respiratory tube of the *Eristalis* larva.

## REVIEWS

**Entomology** A treatment stressing principles rather than merely a manual of types is *A Textbook of Entomology*, by Herbert H. Ross, Professor of Entomology at the University of Illinois. The coverage is broader than customary and more along the lines of a biological survey, as these chapter headings show: Growth of North American Entomology; Arthropoda: Insects and Their Allies; External Anatomy; Internal Anatomy; Physiology; The Life Cycle; The Orders of Insects; Geological History of Insects; Ecological Considerations; Control Considerations.

We admit to a weakness for books that begin with a historical sketch of the subject, relating it to the general field, and introducing the persons who made it. The chapter on physiology is unique, taking up the material under such headings as nutrition, respiration, sensitivity, and the like, as is done in texts devoted wholly to general physiology. Also the separate attention given to insect paleontology, ecology, and to economic entomology deserve high praise. The writing is authoritative, the style easy to read, the content interesting. Only some twelve percent of the illustrations are new, but all are well selected,

the great majority being diagnostic and explanatory line drawings.

Descriptive entomology is not neglected, the chapter on the orders of insects comprising 207 pages. In larger groups, key couplet characters are illustrated with line drawings. We predict wide adoption for this excellent text, well designed to satisfy the needs of an introductory course, also for the general reader who wishes to know something about the largest of all animal groups. Pp. ix, 532; figs. 434. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, 1948. \$6.00.

**History** *Scientific Societies in the United States*, by Ralph S. Bates, a publication of the Technology Press, Massachusetts Institute of Technology, will certainly prove a needed and useful reference. Beginning with a brief survey of the European background and Seventeenth Century America, the author comes to Benjamin Franklin and his *Junto*, founded in 1727, and forerunner of the *American Philosophical Society*. Other Eighteenth Century organizations, both successful and abortive—national, state, and local—are described in the first chapter. There follows: National Growth, 1800-1865; the Triumph of Specialization, 1866-1918; and American Scientific Societies and World Science, 1919-1944. The Increase and Diffusion of Knowledge is the last and, to this reviewer, the most interesting chapter, dealing with meetings, symposia, publications; discussing relative roles in research played by professional and amateur scientist, university and industrial researcher, men and women scientists; and exemplifying the various ways in which societies band together into larger affiliations.

Short but effective reviews of main currents of scientific progress accompany the first four chapters. All parts of the book are thoroughly documented and there is, in addition, a 28-page bibliography and a 26-page index, greatly aiding the utility desired. Pp. vii, 246. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, 1945. \$3.50.

**Genetics** A book we have often drawn upon but not yet reviewed in these columns is Dr. Edgar Altenburg's *Genetics*, a leading text of the subject. Some of the features that have appealed to various critics are: the extremely broad coverage, including all divisions of both classical and modern genetics; the relations of this science to embryology and to evolution; the distinctive headings under which a large number of separate topics receive brief treatment; the comprehensive summaries at the end of each chapter, excellent for study review; the problems following each chapter; the plan of sequence of chapters; the clear, readable, and interesting style; and the selection of type and page size.

By way of criticism in the other direction, there is too much material for a one-semester course, which is, to be sure, not an objection; one can always omit and skip. The author has no trepidation in carrying supposed beginning students of the subject into regions where few teachers of general biology could follow, and we are old-fashioned enough to object to the new symbols and find them unwieldy and less easy of comprehension than the simpler ones still used by most other texts. Some biography of Mendel, de Vries, and a few others would add to the interest, and we object categorically to any genetics text that avoids all mention of eugenics;—the word is not even in the index. The majority of students and readers are less interested in the technicalities of locating genes on cytogenetic maps by means of deletions and inversions than in the practical effects of animal and plant breeding.

As a text for graduate students majoring in biology and as a reference for others, one would have to look far, however, to excel the splendid presentation of Altenburg. Pp. xii, 452; figs. 148. Henry Holt & Co., 257 Fourth Ave., New York 10, 1945. \$3.60.

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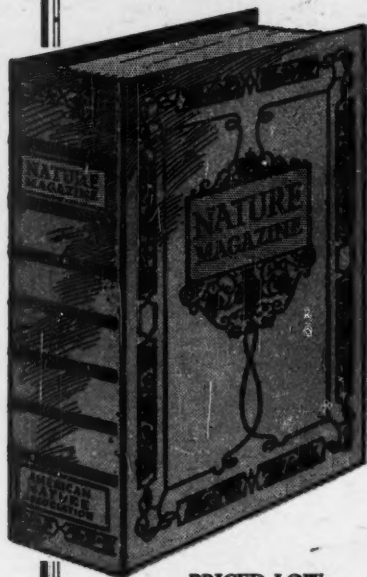
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